

RESEARCH REPORT

Strategic Housing Code Enforcement and Public Health

A Health Impact Assessment in Memphis, Tennessee

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Neighborhood Preservation, Inc. in Memphis, Tennessee, promotes neighborhood revitalization by collaboratively developing practical and sustainable resolutions to blighted properties and to the systems that lead to widespread neglect, vacancy and abandonment of real estate. The Organization focuses on policy advocacy and implementing and documenting replicable comprehensive neighborhood improvement projects.

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Introduction

Where we live matters for our health and well-being. The physical condition of our homes and neighborhoods affects everything from respiratory health to development and behavioral health, from obesity rates to physical safety to mental health and stress levels.

However, policies and programs aimed at improving the conditions, markets, and occupancy of our housing and neighborhoods do not typically focus on health as a primary outcome, even though they have implications for our health. This separation between neighborhood revitalization and health sectors has made it difficult to address the intersection of health and neighborhood development and develop a coordinated effort (Corburn 2009; Rose and Ky-Nam Miller 2016b).

Housing code enforcement—the local government process of administering and enforcing housing codes that are designed to ensure safe and habitable housing conditions within their jurisdiction—is one of the primary strategies for connecting and improving our housing and our health. However, housing code enforcement is often structured to alleviate immediate safety concerns or easily visible problems rather than addressing and improving the longer-term health of residents. Additionally, code enforcement agencies often work in separate agencies and departments from public health organizations, making it difficult to coordinate and collaborate across sectors to solve interrelated problems.

In this report, we examine how housing code enforcement in Memphis, Tennessee, could more strategically prioritize public health as a key outcome of housing policies and programs and better coordinate with public health agencies, community health nonprofits, and the broader system of health care institutions. Using a health impact assessment (HIA) framework, we use qualitative and quantitative data collection and analysis to explore how housing code enforcement works and how it might expand to more intentionally address public health as a key outcome. Although a growing body of research documents the health and safety impacts from living in substandard housing or near vacant properties and abandoned buildings, there is little research that examines potential positive health impacts from the wide array of policy and legal interventions that communities are using to prevent, abate, and reclaim substandard housing and vacant properties (de Leon and Schilling 2017). We explore these potential health benefits in Memphis as a model that other communities can apply and adapt.

Our analysis of the Memphis data and local code enforcement practices revealed that the vast majority of city housing code enforcement service requests are targeted at conditions outside the home

(81 percent of all cases in 2016) and that there is little prioritization of service requests based on the severity of the violation. We also find significant gaps in service as neither bed bugs, lead-based paint, nor mold are directly addressed by any department. There is a low correlation (0.27) between the density of code visits to houses and the number of houses with substandard conditions within a neighborhood, suggesting that code enforcement actions could be better targeted to neighborhoods with greater need. Additionally, there is little relationship between the prevalence of neighborhood crime and the density of code service requests (and even a negative relationship between property crime and code), suggesting either that code enforcement is helping to reduce crime or that it is not effectively reaching high-crime neighborhoods. Finally, we find that code service requests are overconcentrated among single-family units and duplexes and that they are not targeting large apartments and other multifamily housing (i.e., structures with three or more units) as much as they could be.

Based on these findings, we recommend that the Memphis City Department of Neighborhood Improvement (Housing Code Enforcement Department) increase prioritization of service requests to focus on violations that have a higher likelihood of causing serious health problems, expanding coverage to areas and violations that are currently undercovered, making the inspection process more proactive, and increasing collaboration between city code, county environmental health, and a number of other health, housing, and financing organizations. A few actionable steps the department could take towards these ends are:

- Create a system that prioritizes health-related violations and interior health and safety issues.
- Enforce this prioritization through adoption in the housing code enforcement policies and procedures manual and through automatic prioritization in the city's data system.
- Identify violations and neighborhoods that are underserved through code enforcement and expand coverage to those concerns and areas.
- Fill gaps in inspection, investigation, and enforcement coverage through updates to local and state laws, specifically for bed bugs, lead-based paint and mold, and develop a written protocol outlining which agency is responsible for each type of violation.
- Increase community-based education, awareness, and training for residents and home health workers regarding health-related housing issues and code enforcement services and for code inspectors regarding healthy homes.

- Identify ways to enhance resources available for expanding code coverage and for repairing health related violations in homes.
- Institute a formal system of proactive sweeps of problem multifamily properties and neighborhoods and of underserved neighborhoods that are in need.
- Review the current landlord/tenant laws and procedures to determine whether they provide needed protections and remedies to promote and protect health and housing habitability standards and protect tenants from homelessness, and update them if they do not.
- Increase coordination and collaboration between code enforcement, the environmental health department, and other organizations that touch on housing and health to reduce duplication of services, fill in gaps in services, explore mechanisms for improved referral and navigation of housing systems, and secure adequate funding and resources.
- Consider synchronizing the data systems of the Memphis City Code Enforcement Department, the Shelby County Department of Public Health, and the environmental court (among others) so that data are shared in real time.
- Use this and other real-time data to deploy strategic interventions.

Memphis's city and county code enforcement (CE) agencies¹ could have a greater impact on resident health if they better incorporated public health perspectives, metrics, and strategies into their plans and actions and if they better coordinated with health care organizations and stakeholders. The analysis suggests that many opportunities exist to better target and coordinate the city's housing code enforcement function and county public health enforcement responsibilities in Memphis and beyond.

Background

Though health care providers and researchers have historically focused on the individual-level characteristics that impact well-being, studies show that neighborhood conditions and health outcomes are inextricably linked (O'Campo et al. 1997; Roux et al. 2001). Vacant or blighted housing conditions can lead to negative health outcomes, such as asthma, behavioral and learning problems, and physical injury (Bashir 2002; Coulton et al. 2016; Mudarri and Fisk 2007; de Leon and Schilling 2017; Rauh, Chew, and Garfinkel 2002; US Office of the Surgeon General 2009). And vacant or blighted housing is associated with 15 percent higher rates of violent crime (Cui 2010). This leads to both direct impacts on residents through victimization and indirect impacts, such as decreased physical activity (Bell et al. 2013; Chambers and Rosenbaum 2013), which can then lead to further health problems.

In this section, we review the research on the ways in which substandard housing can detrimentally affect our health and how code enforcement might reduce some of these negative health outcomes. The literature on this topic highlights the importance of addressing housing as a social determinant of health and collaborating across sectors to minimize the detrimental impacts that neighborhoods with clusters of poor property conditions can have on residents' health.

Substandard Housing and Health

Living in or near substandard housing can affect our long-term health through its impact on both our physical health and our mental health and cognitive performance. Although there is no single definition, many state and local government housing codes provide a list of minimum standards that define the classic characteristics of substandard housing, including necessities such as lacking or inadequate water, heat, plumbing, bathtubs, showers; structural issues, including crumbling walls, foundations, beams; poor ventilation and low air quality; unsafe or nonexistent electrical services; lead-based paint; and insufficient protection from the elements, such as leaking roofs and uninsulated floors.² Any combination of these conditions in the same dwelling can pose serious threats to the health, safety, and welfare of its occupants.

Physical Health

RESPIRATORY HEALTH

One of the common ways that substandard housing can affect resident health is through increased rates of asthma. Asthma is a chronic respiratory disease that can develop after exposure and inhalation of several possible allergens including mold, dust, and smoke, and particulate matter from rodents and cockroaches.

Leaks in roofs, windows, and plumbing can allow moisture to enter a house or apartment building and create the optimal habitat for mold growth (Rauh, Landrigan, and Claudio 2008). Insufficient ventilation also invites dust, which can trigger asthma. Depending on the home's proximity to factories, refineries, and interstates, poor ventilation can also allow particulate matter to enter a home from poor outdoor-air quality, including smoke and smog (Orellano et al. 2017). Structural damage and a lack of pest control invite rodents and cockroaches into houses and apartments. Finally, inadequate utility efficiency and open structural damage create extremes of temperature. Individually and collectively, these elements can cause chronic asthma complications and acute emergencies (Rauh et al. 2008; Shaw 2004; Wang et al. 2008).

Rauh, Landrigan, and Claudio (2008) find a positive association between housing deterioration (measured in number of physical housing problems, such as holes in the ceilings and walls, water damage, heating/cooling malfunction) and resulting cockroach allergen levels in kitchens, which is an exposure also associated with increased asthma prevalence (Sheehan et al. 2010). Indoor household cockroach allergen levels are proportionally related to degree of household disrepair (Rauh, Chew, and Garfinkel 2002).

Beck and colleagues (2014) find that increased density in asthma-associated housing code violations are associated with population-level illness after controlling for poverty (statistically confirming that these effects are not simply the result of an area's poverty rate). Areas with more mold and cockroach violations per number of properties have higher rates of hospitalization because of asthma exacerbation. Children who have been hospitalized for asthma have 1.84 greater odds of a rehospitalization within 12 months if they live in the highest quartile of housing code violation tracts, compared with those living in the lowest quartile. As a result, the study's authors recommend active patrolling of code enforcement inspectors to remediate the conditions that are creating repeated hospital use. Families who rent their homes are especially vulnerable to conditions that exacerbate asthma and are at higher risk of contracting asthma than homeowners. Ganesh and colleagues (2017)

find that 21.8 percent of rental households have a child with asthma, compared with 16.7 percent of owner households. Further, they find that among all renters and across all exposures, childhood asthma prevalence is higher for low-income renters receiving housing assistance than for low-income renters who do not receive housing assistance. Families who rent their homes may also have limited power to remedy asthma triggers within individual units, which may plague an entire apartment building.

PHYSICAL SAFETY

Crime

Disorder and chaos of the physical environment—in the property itself and the surrounding community—can contribute to criminal activity (Branas et al. 2016; Wilson, Brown, and Schuster 2009). Criminal activity can impact the direct health of residents through victimization and it can affect obesity rates because of the impact of crime on the walkability of neighborhoods (Rose and Ky-Nam Miller 2016a). Vacant buildings have been shown to be related to 15 percent higher rates of violent crime (Cui and Walsh 2015), and the demolition of vacant and dangerous buildings has reduced crime in several cities. In Saginaw, Michigan, vacant-building demolitions reduced violent crime 6.7 percent per year (Stacy 2017), and Cleveland saw a 0.08 reduction in property crimes per quarter after demolitions (Spader, Schuetz, and Cortes 2016).

Maintaining vacant properties by cutting the grass, picking up trash, planting new grass, planting trees, and installing fences on vacant properties can also reduce crime (Sadler et al. 2017). One randomized controlled trial showed that these interventions reduce overall crime 13.3 percent and gun violence 21.9 percent for around \$5 per square meter for the initial work and \$0.50 per square meter for maintenance (Branas et al. 2018). An analysis of the City of Philadelphia’s Doors and Windows Ordinance that required property owners of abandoned buildings to install working doors and windows in all structural openings found that these remedies were significantly associated with citywide reductions in overall crime, total assaults, gun assaults, and nuisance crimes (Kondo et al. 2015).

Injury

Housing structure and safety features are a key input to the risk of residential injury residents face. The surgeon general went so far as to call the linkage between housing quality and injury (along with illness) “clear and compelling,” (US Office of the Surgeon General 2009). The most prevalent injuries to result from poor housing conditions are burns and falls, with the former being caused by exposed heating sources and building design that inhibit exit in the event of a fire and the latter made all the more likely with unprotected windows, breakable glass, stair design, and low levels of lighting (Krieger and Higgins

2002). Senior citizens face particular risk of falling within their household (Eriksen, Greenhalgh-Stanley, and Englehardt 2015).

OBESITY

Neighborhoods that are unsafe, possess poor housing quality, and lack walkability or proximity to recreation often have higher instances of obesity amongst residents considering the lesser availability of opportunities for physical activity. Conducting a review of the literature on the subject, Papas and colleagues (2007) found that 84 percent of scientific research pertaining to obesity and the built environment between 1966 and 2007 reported a statistically significant correlation. In a randomized housing mobility experiment, moving families from high- to lower-poverty neighborhoods resulted in a significant reduction in obesity (Kling et al. 2004).

REDUCED ILLNESS

Infectious Diseases

The prevalence of infectious diseases is often related to substandard housing conditions, including inadequate ventilation in the home and overcrowding. A review panel of experts assessed 40 studies on the topic of ventilation and the airborne transmission of infectious diseases found “strong and sufficient evidence” that poor ventilation within buildings is related to the spread of measles, tuberculosis, chickenpox, influenza, smallpox, and severe acute respiratory syndrome (known as SARS) (Li et al. 2007). Infectious diseases can also spread from lack of proper plumbing and pest infestations (Krieger and Higgins 2002).

Heat- and Cold-Related Illnesses

For those living in homes without adequate heating or insulation, cold and damp housing conditions (and the mold which forms in these environments) can lead to reduced resistance to respiratory illness, increased instances of chest and rheumatic problems, and even death (Olsen 2001). Indoor temperatures below 54 degrees F can lead to higher blood pressure blood viscosity that can cause heart attack or stroke (Collins 1986). Additionally, for those living in adequately insulated homes, high heating and cooling bills have been found to coincide with increased stress levels and can worsen residents state of mental health (Hernández 2016). One quasi-experimental study found that the installation of improved heating systems in previously damp unheated homes led to significant reductions in all respiratory symptoms among childhood asthma and significant reductions in the amount of school days lost because of health (Somerville et al. 2000). In a survey of the epidemiologic

field, Mendall and colleagues (2011) found consensus that damp housing and mold were positively correlated with higher instances of asthma and respiratory issues.

Inversely, in high summer heat, housing without proper insulation or air conditioning can cause a series of negative health effects ranging from heat exhaustion to heat stroke and death (Becker and Stewart 2011). A study of Latino farmworkers in North Carolina found a significant positive correlation between access to air conditioning and quality of sleep, without which individuals are more susceptible to pain, depression, and anxiety (Sandberg et al. 2014). Bell and colleagues (2009) found that communities with higher prevalence of air conditioning were associated with lower exposure to particulate matter and associated negative health effects.

Mental Health and Cognitive Performance

LEAD POISONING

Lead hazards in substandard housing can come in the form of paint, pipes, and even the dirt in yards (residue from external house paint and leaded gasoline from before the 1980s). According to the Centers for Disease Control, any house or apartment building built before 1978 is likely to contain at least some lead-based paint.³ Through expected wear and tear, paint disintegrates to dust that can be inhaled. Children younger than 6 are especially vulnerable to lead poisoning, since their brains are developing at the most rapid period in their lives and they have a greater tendency to place their hands in their mouths. Lead exposure, especially in children, can cause irreversible IQ and attention-span reductions (Needleman et al. 1990; Roper et al. 1991).

A multivariable analysis of national data found that being non-Hispanic black, below the federal poverty level, and living in older housing were major risk factors in higher blood-lead levels for children (Jones et al. 2009). Sampson and Winter (2016) tie the racial component of these effects to neighborhood segregation, with predominantly non-Hispanic black neighborhoods exhibiting much higher rates of elevated blood-lead levels in Chicago.

MENTAL WELL-BEING

Anxiety, depression, and other negative mental health effects appear to be related to housing conditions. In reviewing the literature, Evans, Wells, and Moch (2003) demonstrate the clear link between housing conditions and mental health, with the strongest correlation existing for low-income families with children. One such aspect of poor housing conditions, dampness, has been reported at

higher levels for those scoring worse on general health assessments (Hopton and Hunt 1996) and was found to be positively correlated with depression (Shenassa et al. 2007). Gifford and Lacombe (2006) found a significant relationship for children ages 9 to 12 between their socioemotional health and the physical condition of their home (controlling for gender, household income, housing tenure, parental education, and mental health status). In a longitudinal study of over 2,000 low-income children and adolescents in relation to housing conditions, stability, type, and structure, Coley and colleagues (2013) found not only that poor housing conditions were correlated to negative emotional and behavioral functioning, and associated with lower levels of cognitive development, but that it was the single most predictive factor. Moreover, for those children experiencing worsening housing conditions over time, their emotional and behavioral problems were found to worsen.

STRESS

Substandard housing can generate negative stressors both for the residents of the housing and their neighbors. Younger children who spend more time at home than adolescents are particularly susceptible (Evans 2004; Leventhal and Newman 2010). As they pertain to conditions of housing, dampness and mold (Baldo, Ahman, and Ruff 2002), overcrowding (Badland et al. 2017; Evans 2006), noise levels (Evans 2006; Lowry 1989), and perceived lack of privacy (Fuller, O’Conor, and Rawlinson 1993; Lowry 1989) have all been found to have positive relationships to an individual’s stress levels. Additionally, the financial pressures that often coincide with poor housing conditions often create heightened stress levels for residents.

Crime and associated stressors limit emotional health, which manifests in the form of low perceived health and elevated blood pressure—a risk factor for heart disease. The greening of vacant land has been shown to improve nearby residents’ self-reported mental health (South et al. 2018), partially through their impact on stress.

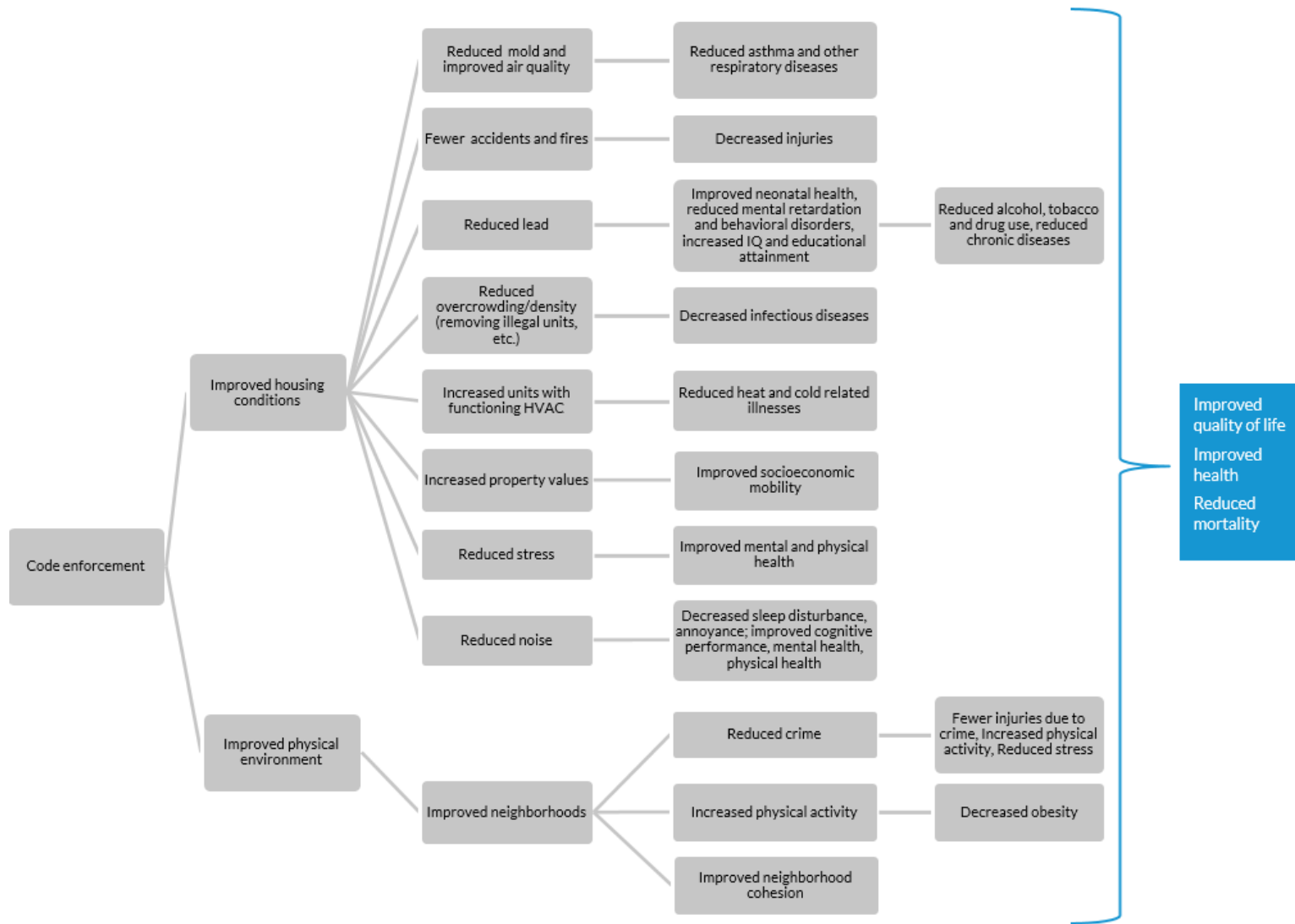
Housing Code Enforcement and Health

One of the primary strategies for addressing substandard housing is ensuring that property owners, lending institutions, and other responsible entities repair, rehabilitate, and maintain their properties consistent with relevant state and local housing codes. Local housing code enforcement (HCE) agencies, a core municipal service, secures compliance with a wide array of housing, building, and property maintenance codes that apply to the habitability and maintenance of single and multifamily dwellings. As the primary entity for administering and enforcing these codes, HCE agencies can take a variety of

voluntary, administrative, and judicial actions when they identify properties that fail to comply with these codes. If done effectively, HCE agencies can help improve population health and reduce crime through improvements to the quality of homes and neighborhoods, reductions to disorder, and increases to economic investment in neighborhoods.

Figure 1 illustrates some of the potential pathways through which HCE could improve population health. In addition to the direct impact that HCE can have on the health of an individual and physical neighborhoods, it can also lead to indirect improvements on health through improved housing conditions, such as through increased property values which can lead to improved socioeconomic status, reduced stress which can improve both mental and physical health, and reduced noise, which can reduce sleep disturbances, annoyance, increase cognitive performance, and improve mental and physical health. However, increased property values can lead to displacement, which should be carefully monitored and prevented through the preservation of affordable housing.

FIGURE 1
Logic Model

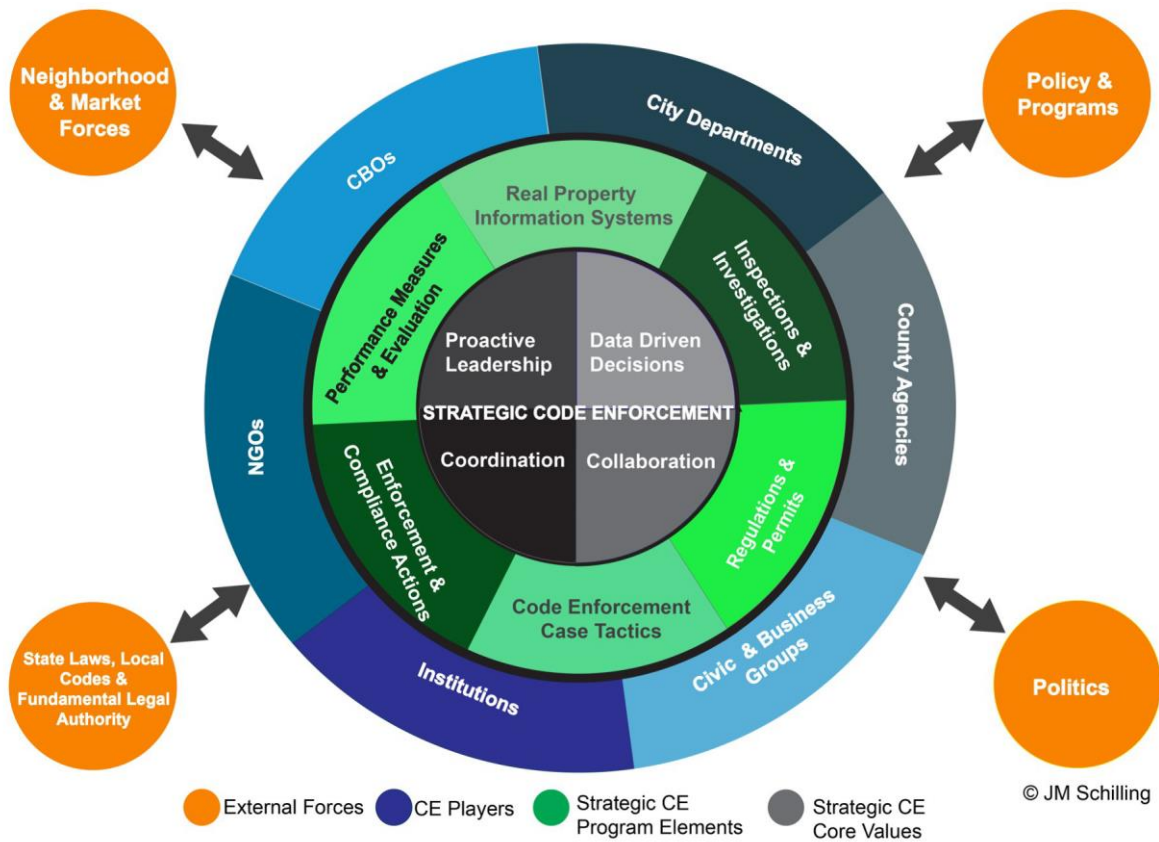


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However, housing and property maintenance codes, along with HCE strategies and practices do not expressly focus on the public health dimensions of their work, as is true for many place-based revitalization initiatives. Scholars point to siloed sectors as the underlying reason for disconnected efforts. Specifically, different jargon, technical expertise, funding streams, and tools make it difficult for health and community development experts to work together on neighborhood revitalization (Fazili 2017; Scally et al. 2017). Though housing and building codes were originally designed and developed to address serious public health problems that tenement housing of the early 20th century caused, HCE agencies today can easily focus more on the technical language of the code and less on the broader socioeconomic and health impacts and outcomes that flow from the day-to-day operations of administering and enforcing the codes.

Today's code enforcement world is more complex as HCE agencies work the frontlines of difficult and complex community problems related to neighborhood decline and disinvestment, mortgage foreclosures, evictions, and insufficient affordable and safe housing (Schilling 2009). As illustrated in figure 2, HCE agencies must now acknowledge and understand they operate within the broader context of changing neighborhood and market conditions along with myriad of policy and planning goals. Because code enforcement involves the development, use, and maintenance of real property, code enforcement cases can be controversial. HCE agencies must also operate within the legal confines of due process and respect individual and property rights as they police and protect the health, safety, and welfare of the community. Traditionally, HCE agencies respond to individual complaints about particular properties and do not always have the resources, legal authority, data, and managerial capacities to take more proactive, coordinated actions.

FIGURE 2
Constellation of Strategic Code Enforcement



Strategic Housing Code Enforcement

Today, HCE agencies are interacting with a wider variety of actors ranging from other city and county departments to community-based organizations to civic and business groups to institutions to change state and local policy, establish data intermediaries, and elevate code enforcement’s role in neighborhood revitalization and public health (figure 2). HCE agencies develop close partnerships with their municipal attorney’s office and the courts as they take administrative and judicial actions against negligent and defiant property owners who fail to care for their properties or neighborhoods.

Considering these new realities, Strategic CE is an emerging model that organizes critical assets, resources, and activities into a dynamic and adaptive system with identified goals, policies, and procedures (box 1) (Lind 2012). It enables HCE agencies to deploy their inspection resources, administrative and judicial remedies, and policy tools in new, proactive ways—targeting the right responses to the right places at the right time. Strategic CE seeks to proactively address problem

properties to further the well-being of residents, neighborhoods, and the broader community. Strategic CE uses the same fundamental administrative processes and legal tools but does so in fundamentally different ways. Instead of being 100 percent complaint driven, Strategic CE programs identify pressing community priorities and take proactive actions to identify, inspect, and gain compliance. Strategic CE prioritizes and tailor's these actions using market, neighborhood-condition, and real property data to help deploy a portfolio of legal and policy interventions to address diverse neighborhood and property conditions.⁴ Strategic CE demands close interagency and interdepartmental coordination and must facilitate meaningful partnerships with community groups and neighborhood residents.

Our health impact assessment (HIA) of housing code enforcement in Memphis rests on a relatively simple theory of change: If the city's HCE agency could effectively adopt and implement a more strategic approach to its compliance and enforcement activities related to substandard housing, the city could help improve the housing conditions for those populations and neighborhoods with the highest concentrations of substandard dwellings and thus improve the health outcomes for the occupants and surrounding neighborhood residents.

BOX 1

The Essence of Strategic Code Enforcement

Although a community and its local government can take many different paths toward adopting and implementing Strategic CE, Lind and Schilling identified a set of core elements and common characteristics based on their technical assistance, training, and research with dozens of communities and CE programs over the past 25 years.³ For any CE program to become strategic, it should have certain threshold capacities and capabilities within all six of the following program elements:

1. Real property information and data systems
2. Inspection and investigation
3. Regulations and permitting
4. Enforcement and compliance actions
5. Case tactics/selection of remedies
6. Performance measurements and evaluation

An HCE agency could have all six program elements in place and still not make strategic decisions or take strategic actions. It must cultivate and sustain a culture that fully embraces Strategic CE from the director to the frontline inspectors and staff. Lind and Schilling outline several core values for Strategic CE:

- Understand code enforcement as an organic system.
- Elevate compliance above enforcement.
- Ensure decisions are data driven.
- Define and track measures of success.
- Engage in collaborative and coordinated actions.
- Develop and support proactive leadership.
- Consider equitable impacts and outcomes.

³ Joe Schilling and Kermit Lind, "Strategic Code Enforcement: A New Model for Reclaiming Vacant Properties and Stabilizing Neighborhoods," (Washington, DC: Vacant Property Research Network, 2018).

Housing, Public Health, and Code Enforcement in Memphis

Memphis, a city of approximately 652,000 people, experienced a decline in population of 6.4 percent between 2000 and 2010⁵ and has a relatively low population density, having expanded 35 percent in land area between 1970 and 2010 but growing only 4 percent in population during this time.⁶ The city also faces high rates of poverty, with 32 percent of families in the city living in poverty and more than half of all children in its county facing economic difficulties (Urban Child Institute 2013). A 2010 Gallup poll showed that 26 percent of Memphis residents could not afford to purchase food over the course of a year.⁷ And according to an Affordable Housing Gap Analysis in 2016, Memphis has an affordable housing deficit of 32,821 units for families at or below 50 percent of the area median income (Aurand et al. 2017).

Not only is there a lack of affordable housing in the city, but the housing that does exist is aging and much of repair. Nearly 40 percent of all occupied housing units in Memphis exhibit at least one of the Census Bureau's physical or financial conditions of poor quality, which include incomplete plumbing or kitchen facilities, more than one occupant per room, and gross rent exceeding 30 percent of a household's income.⁸

The health of Memphis residents is also a concern, with high rates of childhood asthma and chronic diseases concentrated in specific low-income neighborhoods. Childhood asthma affects over 10,000 children in Memphis and was the most common reason for hospitalization in 2015.⁹ Among adults, 8.7 percent have asthma, 15.3 percent have diabetes, and 17.8 percent do not have health insurance coverage. Like childhood asthma rates, these health issues are not evenly distributed across the metro region, they are concentrated in lower-income neighborhoods.¹⁰ The County Health Department's work on life expectancy highlights that zip codes with lower life expectancy also have a higher percentage of the population living below the poverty level (Ogari and Sweat 2016).

Methods and Design

To analyze the relationships between substandard housing, code enforcement, and community health in Memphis, Tennessee, we use a health impact assessment (HIA) framework. HIA is a tool that can be used to assess the potential health impacts of a proposed policy or program. The HIA process involves stakeholder engagement, literature review, qualitative assessment, quantitative assessment, and application of public health expertise to identify how non-health-sector policies or programs might influence health outcomes. We use a modified HIA process to determine the potential impacts of a more strategic code enforcement process in Memphis and to make recommendations to improve that process.

Health Impact Assessments

Health impact assessments aim to make health a key variable considered in policymaking. According to Schnake-Mahl and Norman (2017), it is not always clear to elected officials how much of our health is place based. HIA's allow public health expertise and recommendations to inform decisionmaking without forcing nonhealth actors to digest potentially dense health data (Wernham 2011). More importantly, they force a discussion surrounding health impacts where they previously may have gone overlooked.

Many HIAs have been conducted to assess the potential health impacts of housing, urban planning, and community-development sector policies and programs (Dannenberg et al. 2008). This tool is being used in communities nationwide to help bridge sectoral divides and shape how proposed policies and strategies can be implemented to better support the health and well-being of a target population (Suther and Sandel 2013; Wernham 2011). In some places, such as Baltimore, Maryland, the results of HIAs are directly influencing the zoning code and planning process for the city (Thornton et al. 2013). Research shows that HIAs have an impact on decisionmaking processes; one study found that, out of 23 HIA studies, 14 decisionmakers reported the associated HIA significantly impacted their decision process (Bourcier et al. 2015).

HIAs combine stakeholder input with quantitative health data to construct a predictive model based on the potential policy. Six of the common steps of an HIA are shown in table 1.

TABLE 1

Components of an HIA

Steps	Description
Screen	<ul style="list-style-type: none"> ▪ Identify proposed policy or program within political context ▪ Analyze feasibility of study, expected resource requirements ▪ Determine whether HIA would add value to decisionmaking process
Define scope	<ul style="list-style-type: none"> ▪ Identify goals and stakeholders, and develop logic model diagram ▪ Identify potential health effects ▪ Identify research questions, data sources, and data gaps
Assess	<ul style="list-style-type: none"> ▪ Undertake literature review, stakeholder analysis ▪ Undertake data analysis ▪ Undertake health effects analysis, including baseline analysis
Recommend	<ul style="list-style-type: none"> ▪ Identify proposals and alternatives to mitigate adverse health effects ▪ Create health management plan ▪ Identify stakeholders who could implement recommendations
Report	<ul style="list-style-type: none"> ▪ Analyze proposal population affected, stakeholder engagement, data methods, findings, and recommendations ▪ Communicate recommendations to decisionmakers and other stakeholders
Monitor and evaluate	<ul style="list-style-type: none"> ▪ Track changes in implementation of HIA recommendations ▪ Evaluate if HIA influenced decisionmaking process

Source: Adapted from National Research Council, *Improving Health in the United States: The Role of Health Impact Assessment*, (Washington, DC: National Academies Press, 2011).

Our HIA

Our analysis uses an HIA framework but does not strictly follow the HIA model in that there is not one single proposed policy being considered. Rather, our HIA aims to identify the policies and programs that might help to improve health through the implementation of a more strategic code enforcement process (table 2).

Screening

We began with the screening phase, in which the HIA team and stakeholders determined whether an HIA was needed. To do so, we consulted with practitioners in Memphis to learn about the state of policy and to identify a research area that would both fill a gap in the literature and provide an opportunity for change where it was needed. Bourcier and colleagues (2015) recommend that to maximize the impact of an HIA, the team should select an issue that is already building social momentum for change.

At the time of screening, the city’s housing code enforcement operation was beginning a transformation, spearheaded by recently elected Memphis Mayor Jim Strickland and his appointment of a new director of the City Code Enforcement Department with substantial code enforcement experience. Additionally, housing and public health stakeholders in Memphis had recently come

together to address issues related to blight, code enforcement, and public health. In 2016, leaders from the nonprofit, public, and private sectors collaborated on developing the nation's first blight elimination charter—a series of principles, goals, and actions that would enable stronger coordination across sectors, agencies, and community-based organizations working on these issues.¹¹

Participants in this strategic planning process came together at the first communitywide blight elimination summit in March 2016 to formally endorse the charter and launch the blight elimination steering team to steward the charter's recommendations into action. Around the same time, Le Bonheur Children's Hospital and the University of Memphis School of Law brought together a broad coalition of local health care providers and housing and community development organizations and groups to launch the Memphis/Shelby County Health Homes Partnership and explore the feasibility of becoming a Green and Healthy Homes Initiative site, which was approved in 2017. Collectively these efforts have enabled local policymakers, practitioners, and researchers to better understand the relationships between health, housing quality, community development, neighborhood revitalization, and crime in Memphis. Given the momentum building toward healthy homes, the timing seemed ideal to explore stronger policy and programmatic connections between healthy housing and code enforcement.

Scoping

Once we decided that an HIA was needed and identified the topic area, the team scoped out the work, identifying pathways between code enforcement and potential health impacts. This phase involved a literature review, discussions with experts, and a process mapping of code enforcement interventions. In an HIA, community input is crucial to understanding the needs of the populations most directly affected by a potential policy (Heller et al. 2013). Therefore, we convened a local expert advisory group made up of stakeholders from housing and health nonprofits, public agencies, and community groups to provide input on the research questions and design. This advisory group would later provide feedback on preliminary findings and on final recommendations.

Assessment

After scoping out the work in collaboration with local stakeholders, we turned to assessment, in which we gathered relevant data, assessed the pathways between inputs and impacts, and drew conclusions about the potential impact of proposed solutions. This phase involved working with local partners in Memphis to gather data on city and county code enforcement practices, crime, and health at small

levels of geography. Another important dimension of this HIA was the unique ability to blend qualitative engagement with quantitative analysis of relevant data in Memphis given the momentum around integrated data systems already under way in the city. Beginning in early 2015, Neighborhood Preservation, Inc. (NPI), together with the Memphis Bloomberg Innovation Team, created a real property data portal called the Memphis Property Hub whose primary mission is to document, track, collect, and disseminate existing local and administrative data around real properties, especially blighted, vacant, and foreclosed homes. NPI, Innovate Memphis, and the University of Memphis Center for Applied Earth Science and Engineering Research (CAESER) manage the portal. Through Property Hub, the Memphis HIA team could easily access and analyze point-level data on substandard housing, health, and neighborhood characteristics. We analyzed these data, looking for spatial connections between substandard housing, code enforcement, health, and crime.

In addition to quantitative data, we collected and analyzed qualitative interview data from a variety of local Memphis stakeholders in public, private, and nonprofit sectors to identify ways in which the City Code Enforcement Department could more strategically target health as a key outcome. These qualitative interviews uncovered a complex landscape of city stakeholders working to address these issues and confirmed gaps in services that we had uncovered through the quantitative data analysis.

Recommending, Reporting, and Monitoring

Next, we compiled and crowdsourced recommendations for changes to the code enforcement process in Memphis to improve the public health outcomes of residents. This phase involved discussions with stakeholders, the expert advisory group, and desk research on promising solutions other cities have deployed to address the intersection of substandard housing and health.

Throughout this process, we disseminated intermediate findings to decisionmakers, affected communities, and the general public. This reporting phase will intensify in October 2018, when this report is published and presented it to local stakeholders at the 3rd annual Blight Summit in Memphis. NPI will then take the lead on disseminating the HIA's findings to a variety of different local audiences through presentations at community and policy meetings. The team has plans for outreach beyond Memphis through blog posts and academic articles and presentations.

Finally, we will monitor and evaluate the HIA work through its impact on decisionmaking and health outcomes. This will not only allow us to keep track of the HIA's impact, but it will also allow us to modify our process for future studies.

Challenges to the HIA Process

Two challenges for the Memphis team were their lack of public health expertise and the fact that Urban Institute researchers did not live or work in Memphis. To overcome the challenge around public health expertise, the HIA team worked with mentors from Johns Hopkins University and the University of Memphis' School of Public Health and hired a graduate research assistant from the University of Memphis' School of Public Health (one of three assigned to the project). Tapping into this university public health expertise filled a void of health knowledge within the team and provided crucial guidance on the development of the HIA process. To further incorporate public health experts from Memphis, we ensured that members of the local expert advisory group (described above) included local public health and health care providers.

To address the lack of proximity for most of the research team, we relied on local community advisors and graduate research assistants to conduct qualitative research, provide local insights, and ground truth recommendations. Rounding out the NPI project team to provide the Urban Institute researchers with staff on the ground were two other graduate research assistants. One was from the University of Memphis Cecil C. Humphreys School of Law who had represented the City before the Shelby County Environmental Court (a key focus of the HIA). And the other graduate research assistant was from the University of Memphis School of Urban Affairs and Public Policy who had worked with several community development corporations in neighborhoods experiencing the challenges of vacant, blighted properties.

TABLE 2

Steps of the HIA Process

	Screening	Scoping	Assessing	Recommending	Reporting	Monitoring and evaluating
Goal	Determine whether an HIA is needed	Identify the pathways between code enforcement and potential health impacts	Gather relevant data, assess the pathways between inputs and impacts, and draw conclusions regarding the potential impact of code enforcement	Use the results from the assessment to suggest changes to the CE for the benefit of public health	Disseminate findings to decisionmakers, affected communities, and the general public	Evaluate the HIA according to accepted standards of practice and monitor and measure its impact on decisionmaking and health
HIA overview	Identify the program or policy decision(s) that are part of the HIA	Define HIA objectives and goals Refine research parameters	Refine research questions and other important questions	Compile recommendations based on qualitative and quantitative research findings	Work with code enforcement department to create a plan of action based on findings	Work with the code enforcement department and other stakeholders to set up a system to continue to track health outcomes over time
Community engagement	Determine whether and how the HIA will add value for the community through discussions with stakeholders Develop community outreach and engagement plan for the HIA process	Inventory full list of stakeholders Identify and recruit members for advisory committee Convene advisory group Convene first of three community meetings/focus groups	Convene second meeting of advisory group	Convene second community meeting/focus group	Convene third community meeting potentially combined with a data walk	Convene third meeting of advisory group

	Screening	Scoping	Assessing	Recommending	Reporting	Monitoring and evaluating
Qualitative research	Develop logic model Conduct preliminary literature review	Finalize literature review Design interview guides and interview plan	Conduct interviews and site tours with core Memphis stakeholders Analyze interview data	Analyze results from qualitative research to synthesize policy recommendations	Use storytelling and other techniques to disseminate qualitative findings (e.g., blog posts)	
Quantitative research	Begin to create inventory of data sources	Finalize data inventory Conduct process mapping for the CE interventions	Collect time series data on CE interventions and health conditions Assess baseline health conditions Map baseline health conditions Describe and map CE interventions Estimate relationship between CE interventions and health outcomes using panel econometric techniques Map final health conditions and overlay with CE interventions	Analyze results from quantitative research to synthesize policy recommendations	Use data visualizations and other quantitative techniques to disseminate quant findings in an accessible way	

Data

To undertake the HIA, we collected and analyzed quantitative and qualitative data. The quantitative data include data for Memphis on health, housing, code enforcement, and crime. The qualitative data come from interviews with a variety of key stakeholders throughout the city, including elected and appointed officials, philanthropic leaders, community health workers, health care organizations, nonprofits, and city employees.

Quantitative Data

The quantitative data used for this HIA include both local administrative data and national-level data on health, housing, and crime in Memphis.

LOCAL ADMINISTRATIVE DATA

Our main data are code enforcement data for City Code Enforcement Department service requests (which include any violations reported through the 311 system, emails, phone calls, or noted in the field) issued between 1999 and 2017 from the Center for Applied Earth Science and Engineering Research department at the University of Memphis. This dataset includes point-level information input by City Code Enforcement Department employees. It provides information on the nature of each service request, a text summary of the problem at hand, the department that handled the service request, and the resolution. In addition, we use data from the County Health Department on any health department service requests related to vector mosquitos between 2007–16, vector rabies between 2004–16, and vectors related to urban and rural sanitation (URS) between 2006–16.

To understand the connections between health and substandard housing, we use a few additional local data sources. We use data on birth rates (2011–14), death rates (2010–14), heart disease–related death rates (2010–14), and rates of neoplasms-caused deaths (2010–14) by census tract for Fayette, Shelby, and Tipton counties, which we received from the Shelby County Health Department. In addition, we use blood lead screening data at the zip code level for Shelby County (2012–13). These data include information on the number of children tested for lead grouped by the level of lead poisoning. To capture health outcomes at the census-tract level, we use Centers for Disease Control 500 Cities data on physical health and mental health (2015). Lastly, we use zip code–level data on asthma, including the number of inpatient asthma hospitalizations, the total number of inpatient hospitalizations, and inpatient asthma hospitalizations as a percentage of the total inpatient

hospitalizations. The asthma data are also stratified by age (the population older than 17 and the population younger than 17).

To examine the relationship between crime, code enforcement, and health, we used crime data from the Center for Applied Earth Science and Engineering Research department at the University of Memphis. This dataset includes point-level crime data for the city of Memphis from 2000–11 and 2013–15 and information on the type of offense.

Lastly, through the court monitoring at the Selby County Environmental Court, the specialty court with jurisdiction over issues related to substandard housing and vacant properties, we were able to collect data about all cases heard during the month of November 2017. Information in this dataset includes the reason for the case being in court, the agency or party that brought the issue to court, and the resolution.

ADDITIONAL QUANTITATIVE DATA SOURCES

We supplemented our analyses with information from the US Census Bureau's 2011–15 American Community Survey, obtained through the online portal NHGIS (IPUMS NHGIS, University of Minnesota, www.nhgis.org) and the Memphis Property Hub. ACS data were used to analyze substandard housing conditions, number of units in structure, poverty rate, and racial demographics.

Qualitative Data

Our work started with a general stakeholder inventory of key actors from relevant city and county agencies involved with substandard housing and vacant properties along with community development corporations, health care institutions, public health nonprofits, and a sample of private businesses who own and manage rental housing in Memphis. Most of these actors were mid-level program and project managers or directors of organizations and initiatives along with some frontline staff.

Based on the stakeholder inventory, our local research team began a series of preliminary scoping meetings with the core agencies, housing code enforcement, environmental health, and the Shelby County Environmental Court. Our local partner, NPI, was instrumental in helping the team identify, select, recruit and host many of the meetings. Each meeting uncovered new organizations, stakeholders, and programs that helped us chart the complex landscape of housing and health in Memphis. Our team also developed process flow charts of the city's housing code enforcement and county environmental court to better understand the flow of cases from investigation through enforcement and eventual compliance.

Based on these scoping phone calls and informal meetings, our team conducted a series of focus group interviews with the key actors and organizational leaders starting with a March 2017 site visit by the two coprincipal investigators (co-PIs) on the project, Schilling and Stacy. They were supported by three University of Memphis graduate students who represented diverse disciplines—Stephanie Modert (public health), Christina Crutchfield (urban planning), and Esther Sykes-Wood and Richard Urban (law). The team developed interview protocols for each cluster of stakeholders—government agencies, community development and housing, health care institutions, social service agencies, and private-sector landlords and property owners. Outside of the three visits the co-PIs made (March and September 2017 and March 2018), the graduate research assistant team conducted the majority of these 60–90 minute interviews and compiled their notes for review by the co-PIs.

Analysis Methods

Quantitative Data Analysis

To analyze the quantitative data, we implemented a variety of descriptive methods. First, we geocoded and geographically linked and mapped quantitative data from the data sources listed above. Next, we consider the relationships between various housing conditions, health outcomes, and code enforcement strategies to understand their spatial and temporal relationships. This helped us to understand how well-targeted code enforcement is and where it could improve. It also helped us to identify gaps in services and challenges not being addressed.

In addition to spatially analyzing these data, we ran descriptive and correlational analyses to understand the relationships between code enforcement service requests, crime, substandard housing, and health conditions. To understand code enforcement in the city of Memphis, we used text analysis to sort and classify code enforcement citations based on the type of request and the location of the request (inside or outside the home structure). In addition, we analyzed the relationship between code enforcement service requests and number of units in the housing structure.

Qualitative Data Analysis

To analyze the qualitative data, we developed policy, program, and project snapshots with our graduate research assistant team, or summaries that described the history, goals, and activities of important agencies, entities, and initiatives relative to substandard housing and public health. These snapshots

were the foundation for relevant policy and program descriptions in our report and were shared with the relevant program or project manager or staff for review and revision.

The research team also undertook a stakeholder analysis, which involved organizing the interviews and focus groups into six stakeholder clusters and then assessing their respective organizational interests and drivers. This helped to identify common ground, opportunities for cross-agency and cross-sector coordination and collaboration, and potential challenges and barriers. Based on the stakeholder analysis we started to chart the relationships among these critical organizations and institutions to identify potential patterns of alignment or dissonance around some of the ideas and recommendations around strategic code enforcement policies and practices.

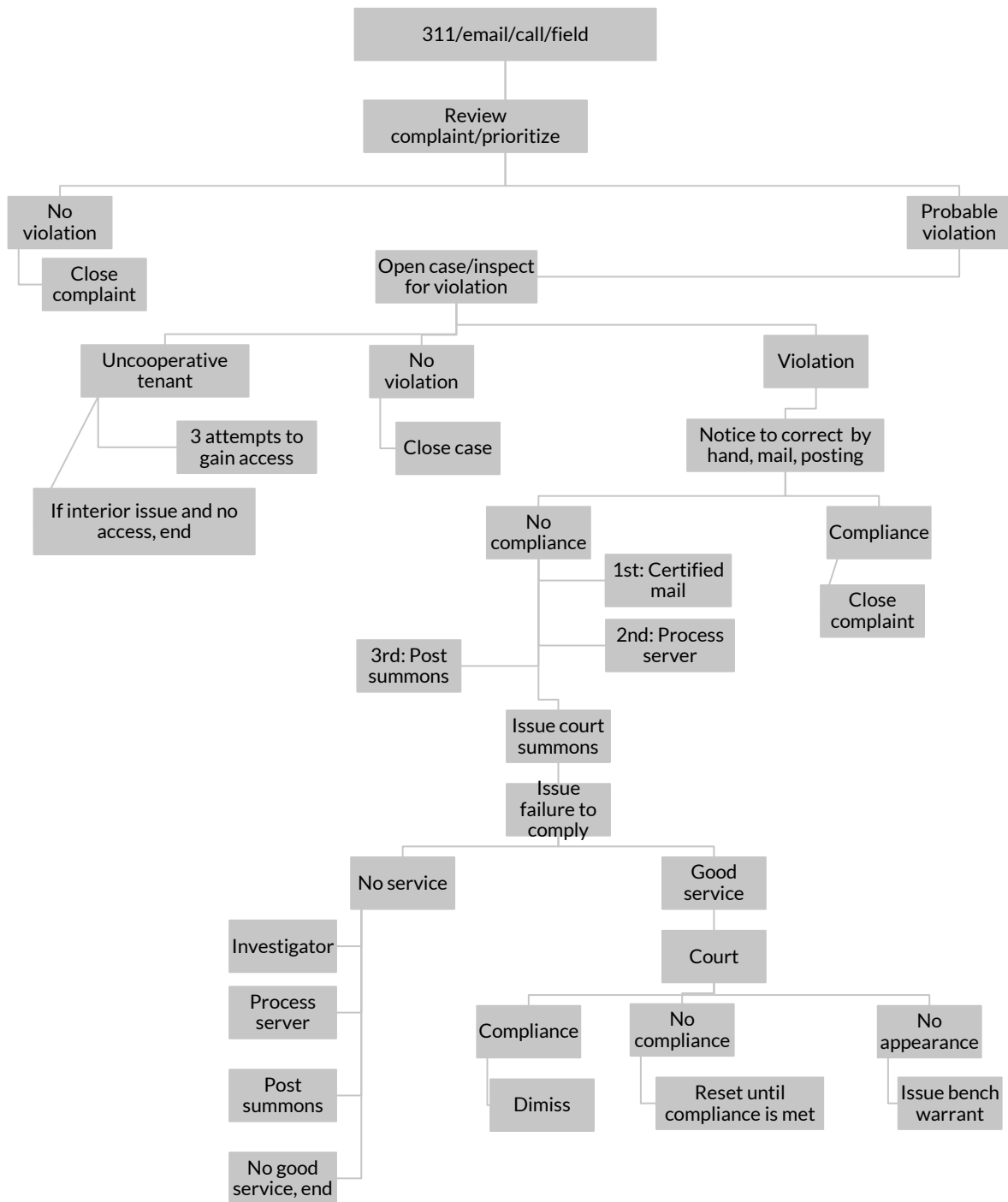
Findings

Code Enforcement Process Map

To begin, we mapped out the code enforcement process in Memphis to understand the many pathways through which a property can make its way through the system. As detailed in figure 3, the code enforcement process begins when a possible violation is reported by 311, email, call, or a note from the field. A file is then opened for review and processing. If no violation is found, the file is closed. If a probable violation is found, a case is opened and inspection for a violation is commenced. Once the inspection is commenced three possibilities exist. First, if the tenant is uncooperative, three attempts to gain access are made. If no access is granted after three attempts to inspect the probable violation, the case is closed. Second, if access is granted and no violation is discovered the case is closed. Third, if access is granted and a violation is discovered, a notice to correct is delivered by hand, mailing, and posting. The case is closed if the owner of the property is compliant following the notice to correct.

If the notice to correct fails to achieve compliance, a summons is issued by (1) certified mail, (2) process server, and (3) posting summons. If there is still a failure to comply and no service, an investigator, process server, and posting summons is attempted. If no service of the summons is achieved, the case ends. If there is good service of the summons, the case is referred to court. If compliance is achieved, the case is dismissed and ends. If there is no compliance, the case is reset until compliance is achieved. Finally, if after good service the defendant fails to appear in court a bench warrant is issued.

FIGURE 3
Code Enforcement Process



When a code case is sent to court, it goes to the Shelby County Environmental Court. This court was established in 1983 adjudicate issues related to Memphis and Shelby County health, fire, zoning, and building codes.¹² The court was created by retired Judge Larry Potter, who believed that housing issues in Memphis and Shelby County were driving blight and crime and needed to be addressed by a specialized court.¹³ The Shelby County Environmental Court began as a city effort to target blight and has transformed into a state sanctioned county court. The court was the first countywide court in the United States to specifically address environmental issues impacting communities.¹⁴ Blighted property remains a significant issue in Memphis and the environmental court is the venue in which statutory tools to address them legally when other efforts do not achieve desired compliance. Based on court data from November 2017, the vast majority of cases are brought to court by the City of Memphis Law Division pursuant to the Tennessee Neighborhood Preservation Act and by the City Code Enforcement Department through administrative citations. Of the court cases brought about by the City Code Enforcement Department, 80 percent pertain to single-family properties and 8 percent pertain to multifamily properties (the rest are unknown property types).

Organizational Landscape

To better understand the landscape of housing and health in Memphis and where code enforcement fits in, we undertook a scan of housing and community development organizations and health organizations in the city. We also identified two groups that are working directly toward the goal of healthy housing.

Housing and Community Development Organizations

Memphis is home to numerous housing and community development organizations, including both public agencies and nonprofit organizations. In this section, we highlight a few key housing stakeholders in Memphis and their role in addressing substandard housing issues citywide.

THE MEMPHIS HOUSING AUTHORITY

The Memphis Housing Authority provides affordable housing through HOPE VI, low-income housing tax credits, Section 8 vouchers, public housing, as well as project-based Section 8 housing. Since 1995 the city has been awarded almost \$145,000,000 dollars in Low-Income Housing Tax Credit funds. These funds have been used to redevelop five former public housing sites to market rate apartments.¹⁵

The Memphis Housing Authority undertakes regular inspections of Housing Choice Voucher properties. These occur before tenant move-in and annually thereafter. Additional inspections can occur in the event of tenant complaint and emergency inspections are conducted if the housing authority believes a situation is life-threatening. Such emergency circumstances include lack of heat during the winter, lack of electricity, lack of running water, gas leaks or fumes, plumbing leakages, electrical outlets that are a fire hazard, or natural disaster that makes a unit uninhabitable.¹⁶

THE MEMPHIS DIVISION OF HOUSING AND COMMUNITY DEVELOPMENT

The City of Memphis's Division of Housing and Community Development (HCD) is responsible for administering US Department of Housing and Urban Development (HUD) resources in Memphis along with providing technical support for the city's nonprofit housing developers through its Nonprofit Housing Center.¹⁷ HCD manages programs that touch important housing issues, such as homelessness, down payment assistance, and affordable housing development. They also manage the city's Environmental Protection Agency approved Lead-Based Paint Program, which serves single-family or renter households that meet income eligibility and prioritizes households that were referred from the Shelby County Health Department and have children present. This program conducts lead paint inspections, will repaint areas of qualified homes with lead-free paint, and disposes of lead contaminated objects free of charge for lower-income residents based on a sliding scale of household size and income (below \$46,400 annual household income for a family of four) through their LEAD-SAFE program.¹⁸

COMMUNITY DEVELOPMENT CORPORATIONS

Community development corporations (CDCs) are critical housing and neighborhood revitalization stakeholders in Memphis. Some such organizations develop multi- or single-family housing. Some CDCs have firsthand experiences with tenants and code enforcement or have working knowledge of the housing market in a particular neighborhood, housing incentives, and other programs that promote healthy housing.

There are approximately 31 CDCs within the city of Memphis (Community Lift 2015). Some of these organizations are neighborhood associations that function as a community development corporation, even though they do not have "CDC" in their title. For example, the Vollintine Evergreen Community Association, a neighborhood association, was responsible for bringing walking trails to the neighborhood and creating historic districts. Other CDCs primarily promote neighborhood watch campaigns or community block parties and are more focused on the social development of communities

than on the physical development. Many CDCs are members of BLDG Memphis, which offers resources, programming, and networking opportunities. The work of several of the CDCs interviewed for our HIA stakeholder analysis are summarized in table 3.

TABLE 3
A Sample of CDCs in Memphis

Organization name	Housing-related work	Other areas in which they work
Frayser Community Development Corporation ^a	<ul style="list-style-type: none"> ■ To date the Frayser Community Development Corporation has renovated 200 single-family homes. These homes are either sold to new homeowners or are rented. The CDC is growing at a rapid pace, renovating and placing families in about 25 homes a year. ■ The CDC also leases about 100 properties in the Frayser community as well as managing 22 properties for another local nonprofit. 	<ul style="list-style-type: none"> ■ Community building ■ Housing counseling ■ Data and research ■ Housing renovation for low-income home owners ■ Commercial development
Binghampton Development Corporation ^b	<ul style="list-style-type: none"> ■ BDC owns and operates approximately 70 residential rental units. ■ They own and operate a grocery anchored commercial development. ■ In addition to their development work, the Binghampton CDC does community asset building and supports personal capacity development. 	<ul style="list-style-type: none"> ■ Community building ■ Student outreach ■ Economic development ■ Job training
The Works, Inc. ^c	<ul style="list-style-type: none"> ■ The Works owns and operates the 80-unit low-income housing development known as Alpha Renaissance apartments. The development was constructed using low-income housing credits. Tenants of the apartment usually make at least 60 percent under the Memphis median area income. ■ They also have a program called DreamWorks. That provides funding for home renovations to those who meet HUD income guidelines. ■ The Works can act as a small mortgage lender for properties that cost less than \$50,000. This program is called the Opportunity Home Loan Fund. Applicants must meet HUD requirements, must be a first-time homebuyer, and must purchase a home within one of the five South Memphis zip codes. 	<ul style="list-style-type: none"> ■ Community development ■ Education and resources
The Heights CDC ^d	<ul style="list-style-type: none"> ■ The Heights CDC, is building the capacity of neighborhood associations by linking them with funding sources that empower residents to tackle blighted properties with community clean ups. In partnership with the Heights CDC, resident leaders have participated in the development of neighborhood gardens and pocket parks. ■ The Heights CDC has rehabbed 10 blighted properties and is providing affordable housing to families in the community. ■ The Heights CDC is also working on an ambitious project called the Heights Line. The Heights Line is a proposed 1.75-mile linear green space and trail on National Street from Summer Avenue to Bayliss Avenue. The Heights Line will connect to the Wolf River 	

Organization name	Housing-related work	Other areas in which they work
	Greenway via North Highland Street and to the Shelby Farms Greenline and the Hampline via Broad Avenue. Design features include park spaces down the length of National Street, bicycle and pedestrian trails, public gathering areas, and recreational spaces. This grassroots project is locally initiated and managed by the HCDC and is currently in the design and planning phase.	

^a“Frayser CDC Mission,” Frayser CDC, accessed October 17, 2018, <https://www.fraysercdc.org/mission/>.

^b“BDC Place,” Binghamton Development Corporation, accessed October 17, 2018, <https://www.bdcmemphis.org/place>.

^c“About Us,” The Works, Inc., accessed October 17, 2018, <http://theworkscdc.org/>.

^d“About the CDC,” The Heights CDC, accessed October 17, 2018, <https://theheightscdc.com/about/>.

Health Organizations

COUNTY HEALTH DEPARTMENT

The Shelby County Health Department focuses on communitywide health concerns, including environmental health issues; infectious diseases; maternal and child health; school health; health code standards; and health education.¹⁹ Their work intersects with code enforcement on matters related to pest abatement, mosquito-borne disease abatement, and the enforcement of grass and weed ordinances. In addition to providing home inspections for rats, they have an emphasis on resident education about pest abatement and prevention. In addition, the Shelby County Health Department operates the Child Lead Poisoning Prevention Program, through which they investigate the homes of children who have lead poisoning and provide medical services and family education to reduce high blood-lead levels. This program works closely with the City and County Lead Programs and makes referrals to them for lead remediation services.

HEALTH CARE AND SOCIAL SERVICES PROVIDERS

Memphis has an extensive network of major hospitals with affiliated and satellite offices along with a number of faith-based community health centers or clinics such as Church Health Center.²⁰ The largest health care institutions in Memphis appear to be Baptist Memorial Healthcare Corporation, Methodist Le Bonheur Healthcare, and Regional One.²¹ Memphis is also home to the University of Tennessee Health Science Center and the University of Memphis School of Public Health. Several of these institutions are located in Memphis Medical Center, a designated district between downtown and midtown that is home to Regional One, the Memphis Bioworks Foundation, and the Southern College of Optometry.

As part of our qualitative research we identified and interviewed staff from several health care and social service providers as they often have clients and customers who have health conditions that are connected with and exacerbated by living in substandard housing conditions. The interviews offered insights into the connections between health problems and housing conditions based on the experiences of the doctors and staff within these organizations. For example, Church Health Center operates a new location at Crosstown Concourse that sees only uninsured patients and fees are based on a sliding scale of income. Our team interviewed doctors from a popular clinic in the heart of the Memphis's more distressed neighborhoods, Resurrection Health, that subsequently closed this location as part of its merger with Cherokee Health Systems located in Frayser.

Beyond health care, our research also identified a few social service nonprofits that often coordinate with health care providers to offer their low-income patients, who are often tenants living in substandard properties, with critical support services that can range from parenting classes to legal advice and representation. Organizations that we met with included the University of Memphis Law Schools Medical-Legal Partnership Clinic and Agape Family Services.

Healthy Housing Groups

There are several groups and organizations that work specifically toward healthier housing within the city of Memphis.

LE BONHEUR'S CHANGING HIGH-RISK ASTHMA IN MEMPHIS THROUGH PARTNERSHIP (CHAMP) PROGRAM

Le Bonheur Children's Hospital launched CHAMP in 2012 to target asthma, which in Memphis and Shelby County disproportionately affects low-income African American children. CHAMP's multi-disciplinary team of clinicians and community health workers provides clinical services, a 24-hour hotline, asthma education on how to better manage the disease, and social service supports and referrals. As a result, for the nearly 800 children in the program, hospitalizations are down 70 percent, and the cost of care for each child has been cut in half. Though CHAMP is not a housing program, home environmental conditions have been a major focus. The staff make conduct a home environmental assessment, and with the family's consent, will make referrals for housing services or code enforcement if mold, pests and other concerns are identified. Le Bonheur also actively works through the Memphis/Shelby County Healthy Homes Partnership with other organizations, including Green and Healthy Homes Initiative and NPI, to support and advocate for needed systems change in the delivery of housing services and code enforcement.

MEMPHIS AND SHELBY COUNTY GREEN AND HEALTHY HOMES INITIATIVE SITE

The City of Memphis and Shelby County recently became a Green and Healthy Homes Initiative (GHHI) site, joining more than 20 other GHHI sites across the country. The Memphis/Shelby County GHHI seeks to lower incidences of asthma-related emergency room visits and hospitalizations, lower rates of lead poisoning, and improve home energy efficiency through weatherization.²² GHHI is implementing a combined intake form and triage team eligibility review process so that multiple service providers can assist families that need and qualify for more than one service. Families may be referred through health or housing service providers. Another key element of the GHHI model is for service providers to collaborate in identifying and removing common programmatic barriers to accessing housing services, funding gaps and in increasing available resources.

MEMPHIS AND SHELBY COUNTY HEALTHY HOMES PARTNERSHIP

In 2014, a group of Memphis health, housing and legal services agencies formed the Healthy Homes Partnership (HHP) and began work to raise awareness of the health impacts of substandard housing and to research best practices to address childhood lead poisoning, pediatric asthma, and other concerns. In 2014–17 the HHP convened quarterly meetings, provided healthy homes training to more than 100 participants, and began work on a shared system for making housing services referrals. HHP members also established a Master Home Environmentalist program which provides free home assessments and education on ways residents can address common home health hazards. In 2017, HHP members spearheaded the designation of Memphis/Shelby County as a GHHI site and raised funds to support the site initiative. The HHP and its members continue to support these and other efforts to advance healthy housing, including NPI's work on improving health in housing through code enforcement.

MEMPHIS LEAD-SAFE COLLABORATIVE

The City of Memphis and Shelby County Lead Safe Collaborative brings together local organizations and communities to address persistent lead exposure. Members conduct education about the sources, causes and health risks of short and long-term lead poisoning in at-risk communities. Members also collect and share data on communities most impacted by lead, and collaborate and conduct advocacy with federal, state and local governmental entities, policy makers and community nonprofits to increase awareness, preventive measures and services to reduce lead poisoning.

Qualitative Data Analysis

Our local interviews and focus groups revealed a complex web of organizations, programs, and individuals working at different intersections of health, housing, and code enforcement. Each group seeks to address the socioeconomic and environmental impacts on tenants, families, and neighborhoods who live in or near substandard housing or vacant properties. The challenge for Memphis, as it is in many cities, is how best to align these individual programs and interventions into a more cohesive, systematic approach that could improve health outcomes for these vulnerable, low-income residents. Below we analyze the results from our focus groups that involved interviews with close to 50 individuals representing 15 organizations, along with dozens of follow up conversations and emails.

Stakeholder Analysis

Based on our interviews, we identified six stakeholder clusters²³ that represent the typical housing, health, and code enforcement organizations found in many communities. The clusters cut across relevant public, private, and nonprofit sectors. Some organizations focus their activities and attention on built environment issues, such as property, buildings, housing, neighborhoods, infrastructure. Other organizations focus their resources and programs on people—the tenants, families, and neighbors—whose health and safety are affected by substandard housing. A few occupy the role of an intermediary as they convene and coordinate across sectors and stakeholders. As this was our preliminary attempt to chart the housing, health, and code enforcement ecosystems, we were unable to sit down and interview everyone or every organization that touches (or should touch) Memphis' substandard housing problems.

For purposes of our stakeholder interviews and analysis, our conversations examined the existing health, housing, and code enforcement policies, programs, projects, plans, and practices (the 5Ps) that address substandard rental housing in Memphis. Beyond their respective interventions and initiatives, we also explored stakeholder awareness and understanding of the relationship of substandard housing and public health to begin to identify gaps in knowledge and practice as well as opportunities for potential cross-sector, cross-agency coordination and alignment. Our stakeholder analysis relies on the traditional conceptual frameworks of interest-based negotiation, consensus building, and collaborative planning to identify the underlying interests of each cluster and note potential differences and common ground.²⁴ For example, we found alignment around the common interest of protecting health and public safety across the public or government and nonprofit clusters, but the entities each have their own perspective on what health and safety means for their organization and how that shapes their roles,

responsibilities, and actions. Conversely, these clusters did not always understand or fully appreciate the perspectives and priorities of the other clusters. Below we identify the primary interests for each cluster, note how that interest compares with other clusters, tease out some distinctions among the organizations within the cluster, and discuss their insights about the relationship between public health, substandard housing, and code enforcement.

PROPERTY OWNERS AND RENTAL HOUSING MANAGERS

As those engaged in the business of acquiring, rehabilitating, maintaining, and managing rental housing, property owners, landlords, and their staffs are primarily concerned with preserving and expanding their financial bottom lines. They must balance the costs of basic repairs, maintenance, and management with what renters are willing and able to pay so the property generates a reasonable return on investment. Factors, such as the building's age and neighborhood location, can impact the return as rental markets can change and vary dramatically across different neighborhoods.

Within our landlord and property owner focus group, the participating landlords generally agreed that providing decent and safe housing also makes good business sense. Good buildings and good tenants attract and can mutually reinforce one another. Location and neighborhood markets, however, can alter that equation. Most of the landlords in our focus group owned or managed market rate rental properties in comparatively stable, middle-income Memphis neighborhoods. A few of these landlords own or manage smaller complexes, many with HUD Section 8 voucher tenants in neighborhoods where issues of crime and vacant properties are more prevalent. For these property owners and managers, crime and violence with and near their apartments, often became the predominant public health issue to protect their financial investments in the property.

The traditional tension within many tenant-owner relationships was present in our analysis, which can make it difficult for HCE to address substandard rental properties. Landlords blame tenants for not maintaining their units and tenants complain about lack of services, repairs, and responsiveness. Several management companies shared their frustrations when tenants would withhold rent to draw attention to a structural or maintenance issue that were not addressed to their expectations. This tension can lead to retaliatory action by the landlords, though it was not mentioned during our interviews, which can dissuade tenants from filing a complaint with HCE.

TENANTS

Although our research plan initially included focus groups with residents who live in substandard housing, we were concerned that such conversations might expose the tenants' identities that could

cause risks of eviction and similar trauma. For purposes of our stakeholder analysis, however, we were able to capture the tenants' perspective from our focus groups with health providers and social service providers who shared general stories of working with this vulnerable population without specific references to addresses, names or other identifying information. In curating these individual stories and secondary experiences, what we found is that many of these tenants and their families live on the edge, in precarious economic situations (e.g., working two to three low-paying service jobs without health care benefits) that limits their housing options to those single-family and multifamily rental properties that are not well maintained and are in neighborhoods with other deteriorating, vacant, and abandoned properties. In many respects their primary interest is month-to-month survival for individual and family stability. Considering this interest, tenants are less likely, in some situations unlikely to report substandard housing conditions to HCE for fear of eviction by the landlord. Several of the health and social service providers who have special home visitations programs shared their observations and experiences working with their tenant clients and in many cases homeowners to remedy the unsafe and unhealthy housing conditions. Sometimes the home visitation worker would educate the tenant about the unhealthy conditions of their house or apartment and advise them on what they could do on their own to ensure a clean and safe house or unit. If the conditions were beyond the control or capability of the tenant, the home visitation work might intercede with the landlord on behalf of the tenant or client to seek repairs and alert them to health risks of the environment on children. And, in some cases, they would coordinate with relevant medical-legal service programs to counsel or assist the tenant with any future or pending eviction actions.

GOVERNMENT—CITY OF MEMPHIS AND SHELBY COUNTY

Our interviews included the key actors who administer and enforce relevant provisions of the city of Memphis's property maintenance, housing, and environmental health codes, such as the director and senior staff for the Housing Code Enforcement division (under the Department of Public Works), the Shelby County Health Department—Environmental Health Division, and the judge and referee for the Shelby County Environmental Court. The primary responsibility, and thus focal point, for this HIA is to address the impacts of substandard housing. Thus, our team also developed process maps that outline the general steps for each of the three enforcement entities take to gain compliance with relevant codes.

Based on the applicable legal authority, program budgets and staffing, and customary organizational practices, each entity devotes most, if not all, of its resources and energy to operating their respective compliance and enforcement systems: the intake and processing of complaints (sometimes called service requests), the issuances of notices, the inspection of properties, and the filing

and processing of enforcement cases. The overriding organizational interest for each entity is protection of the public's health, safety, and welfare, but they seem to have their own perspectives and their own operational definitions of public safety and public health and its relationship to housing and neighborhoods.

Moreover, perpetuating the integrity of code enforcement process itself can seemingly become an interest as the court and the two code enforcement agencies often operate autonomously and without direct connections to the range of broader public health policy goals and health outcomes that are associated with substandard housing, such as asthma and mold. For Memphis HCE, the underlying interest is to manage and sustain the enforcement process first. Protection of public safety will naturally flow from each and every action it takes. Despite holding common interests in protecting public safety and health, differing priorities and definitions of severity have strained relationships among the agencies in past collaboration.

Shelby County's Environmental Health Division more explicitly understands the health and housing relationship, but their legal and policy jurisdiction is limited to exterior conditions that promote rodent harborages and mosquito control that may more directly prevent sources of disease. Further, the health promotion and epidemiology divisions of other branches of the division focus most of their resources on lifestyle changes to reduce obesity and diabetes and limiting infectious diseases. They have limited capacity to also include housing-related health conditions such as asthma despite its prevalence.

Once cases come before the environmental court, it can take the public health into account when making its decisions and fashioning relevant compliance orders. However, it can only intercede on those cases that come before it as they are rarely isolated cases within their community. Thus, these code enforcement systems are designed only look at the individual cases that come before, which makes it more problematic to address public health concerns one property at a time.

In contrast with code enforcement, the City of Memphis Housing and Community Development (HCD) Department inherently has a broader view and more indirect role when addressing the public health impacts from substandard rental housing.²⁵ HCD's underlying interest focuses more at the neighborhood scale in collaboration with community-based organizations, such as community development corporations (CDCs). They administer federal, state, and local housing resources that facilitate the revitalization of neighborhoods and properties, such as HOME funds that help new developments and Community development Block Grants (CDBG). Compared with the code enforcement apparatus, HCD seems to have the jurisdiction and perhaps capacity that could assist landlords rehabilitate substandard rental properties.²⁶

NONPROFIT HOUSING PROVIDERS AND COMMUNITY DEVELOPMENT OR COMMUNITY-BASED ORGANIZATIONS

Early sections of this report highlight many of the diverse programs and activities community development entities and housing providers undertake in Memphis to stabilize markets and revitalize neighborhoods. Many of these groups and organizations are involved with some dimension of housing, physical neighborhood improvements, and basic neighborhood organizing. Each entity adjusts and tailors their interventions depending on their capacity and history as well as the local priorities and ever-changing conditions and dynamics within their specific neighborhood. Not every designated neighborhood has a functional or recognized CDC, community-based organization (CBO), or neighborhood association.

The one consistent interest across all of these place-based organizations and groups is their deep commitment to their neighborhoods that drives much, if not all, of their programming, investments, and decisions. By neighborhood, they include its physical boundaries, infrastructure, buildings—the built environment—and the civic infrastructure, institutions, people and families who make the neighborhood what it is. They especially emphasize homeownership and devote substantial time in assisting families in that process.

INTEREST AND COLLABORATION IN HEALTH AND HOUSING

What seems less clear from our focus groups is the extent to which these individual organizations have a collective interest that supports each other or that facilitates cross-neighborhood coordination and collaboration. We heard of examples of such cross-neighborhood efforts, but they seemed rare. Public health organizations and their members understand the role that housing and neighborhoods can play on the overall health of its residents, especially in those neighborhoods that are predominately low income, communities of color. Although they are aware of the relationship of housing, neighborhoods, and health, few were involved with direct health-related programming as health is not their primary mission or responsibility. We sensed a strong interest to learn and do more in the health and housing space as several of the high-capacity CDCs or CBOs are expanding their activities to include or involve different health and social service providers.

Many of the CDCs and CBOs that have done work with HCE relative to code enforcement cases or violations within their neighborhood. Though most of these interactions have been and remain positive, several expressed concern over the inability of HCE to address what they consider to be priority properties in their neighborhood. Certainly, their perspectives on HCE are shaped by poor experiences with past cases and the level of engagement by HCE inspectors currently assigned to their neighborhood.

Health Care Providers

Memphis has a robust and engaged network of health care providers and institutions that work directly with the children and families who suffer from medical conditions that are driven by living within substandard rental housing and near vacant and abandoned properties. Many have taken the lead in reaching outside the health domain to housing providers, CDCs or CBOs, and local intermediaries to establish new relationships. Several have developed or are developing interventions that link and address specific conditions, such as asthma, to conditions in the home and neighborhood. In some cases, the provider has access to a social worker who is able to help the family relocate, but cases seem rare. Even with this new interest in the relationship of housing and health, the primary interest and mission of the health care providers is the wellness of patients and their families, with the most familiar approach being a clinical one. As many of these organization are private businesses, they must also consider the business aspect of health care when exploring this new dimension of the social determinants of health. Smaller groups of primary care providers functioning independently from a hospital also have reduced capacity to address diverse social elements contributing to compromised health. However, when families find the means to relocate through their own family or social ties, the health clinicians shared anecdotal evidence of the tenants' improved health and decreased ER visits in cases of asthma.

Social and Legal Service Providers

We identified several nonprofits that provide tenants with support services. Memphis Child Medical Legal Partnership, (MLP) was jointly established by Le Bonheur, University of Memphis School of Law, Memphis Area Legal Services and UTHSC. The MLP advocates for and represents patients at and participants of community-based programs through Le Bonheur, where it is housed. Less than 20 percent of the MLP's cases related to housing, and some of these do include tenant-landlord issues.

Other social service providers (e.g., Agape) recognize the link between health and housing and operate in the most acute and dire cases to address homelessness. In cases of substandard housing, they have been known to take a similar approach to the legal service providers, but they first encourage the tenant to approach their property owner themselves to become their own advocate. Many providers have productive relationships with CDC's for shared programming, but most of the health programming includes mental health discussions, cooking classes, and achieving economic stability without much discussion on housing-related health.

Intermediaries, Institutions, and Networks or Collaboratives

Several of these entities and organizations work across sectors, fields, and organizations on the different dimensions of substandard, vacant, and abandoned property or they provide technical support to those involved in the front lines of Memphis's efforts to address blighted properties.

NPI and the Memphis Property Hub data portal fit this intermediary role. Although we did not formally interview either entity,²⁷ we observed the multifaceted support roles they play within Memphis's ecosystem of organizations seeking to prevent, rehab, and reclaim substandard, vacant, and abandoned properties. NPI administers a number of programs and initiatives that engage all sectors (public, private, and nonprofit) along with a focus on policy change. Although the Memphis Property Hub is operated through the University of Memphis Center for Applied Earth Science and Engineering Research (CAESER), its research, analysis, and data curation services support the policies and programs of the other stakeholders, such as the Blight Elimination Steering Team, HCE, NPI, and other nonprofit and public-sector stakeholders. The Hub and NPI bring additional capacities and expertise that are essential in moving Memphis toward a strategic code enforcement model.

NPI's mission—grounded in the Blight Elimination Charter that they helped develop and bring into existence—is to improve the quality of life in all Memphis neighborhoods through the elimination of blighted properties. NPI believes that every resident, regardless of race or income, deserves to live in a place that is free from the harms of blight. Although their traditional expertise is the vacant property reclamation and reuse systems, NPI understands the connections with public health and the built environment. It has an underlying expertise and interest in fashioning collaborative cross-sector solutions, so, in some ways, collective impact is also one of NPI's underlying interests.

The Healthy Homes Partnership has worked with the national GHHI program to establish the local Memphis/Shelby County GHHI site. The HHP and local GHHI program are led by more or less the same multi-sector group of healthcare providers, public health organizations, housing service providers, legal services entities and community development organizations. Similar to NPI, the local HHP and GHHI participants have an underlying interest in cross sector collaboration that is grounded in the concepts of addressing the social determinants of health through better housing. They also have an immediate interest in building a coalition of health and housing providers who support and follow the GHHI model's practice of braiding multiple funding streams to provide comprehensive health and energy-efficiency rehabilitation work that is focused on better health outcomes for homeowners and renters.

GHHI has also been exploring with Le Bonheur CHAMP and other state and local partners the potential of social innovation funding to support healthy homes services for asthma patients as well as other vulnerable populations, including seniors. The "Pay for Success" model proposes using private

sector investments to fund health-focused home rehabilitation, and to ultimately repay such investment from future cost savings (or value-based payments) by state Medicaid agencies or their Managed Care Organizations.

University of Memphis School of Public Health, Law School, and School of Urban Affairs and Public Policy also play a cross-cutting role as they have researchers from each school examine different aspects of health and housing depending on their discipline. A few actually provide community capacities by engaging graduate students in field work, such as the University of Memphis Cecil B Humphreys School of Law Neighborhood Preservation Clinic (Barlow, Sxhaffzin, and Williams 2017). The universities primary interest is service learning opportunities and research benefits (e.g., publications, findings). The final group that becomes the intermediary cluster are the local foundations that fund much the health and housing work, with some recent support from national foundations (Kresge and Robert Wood Johnson Foundation).

Observations and Insights from the Qualitative Research

This section provides a few high-level insights and observations about the clusters that could help position and facilitate the HIA's recommendations and findings for collective action by many of the stakeholders and their organizations that we met with and interviewed.

- **Divergent definitions of public health.** There was common interest among many of the housing and health stakeholders around protecting public safety, but they diverge when it comes to whether their primary mission is protecting public health versus public safety, whether public health is a top priority, whose public health should they protect, and what their role is in protecting public health.
- **Housing and health policy.** Policymaking and the process of policy change involve a complex series of interactions and interrelations that Memphians, as in many cities, are in the early stages of uncovering, identifying, and acknowledging as they prepare for collective action around substandard housing and public health. In Memphis, the interplay of housing market instability and inequality and the legacy of poverty and race exacerbate the city's substandard housing challenges and shape the proposed interventions and recommendations.
- **Rehabilitation resources.** By focusing on the intersection of housing, health, and code enforcement, our HIA examines the inspection, investigation, and enforcement dimensions of addressing substandard housing, it did not explore in depth the economics and business models of the Memphis rental property businesses. Nor did it inventory current public, nonprofit and

philanthropic housing and community development resources. Going forward, it will be critical for local leaders to understand what interventions, policy changes and program resources, could be put in place to encourage and support the rehabilitation and maintenance of rental properties, especially in these neighborhoods with highest concentrations of renters and rental properties.

- **Pivotal role of the intermediaries.** Through the work primarily of NPI and HHP, the housing and health sectors (the organizations and the individual leaders) are starting to know each other and enhancing their understanding of housing as a social determinants of health. HHP seems to provide a forum for maintaining these individual and organizational connections and relationships in Memphis. However, this is a relatively new phenomena and critical first step in laying the groundwork for collective action. The role of NPI and HHP will be critical in maintaining momentum across the health and housing sectors in Memphis.
- **Data sharing to strengthen collaboration and collective impact.** Need better data to document the relationship between substandard housing and health and the impacts that could flow from taking a more strategic approach to code enforcement. Collecting, interpreting, and applying relevant health, housing, and code enforcement data remains difficult. This difficulty stems from the fragmented systems to source the data: Property Hub, HCE, environmental court, health care providers, public health data (e.g., 500 Cities) at broader scale. Clinic Information System (CIS) data to consider a neighborhood as an element of “personalized medicine” is more feasible than ever with electronic medical records. However, regulations that protect the confidentiality of health information limits the utilization almost exclusively to someone already affiliated with that health provider and is lower priority than clinical needs.

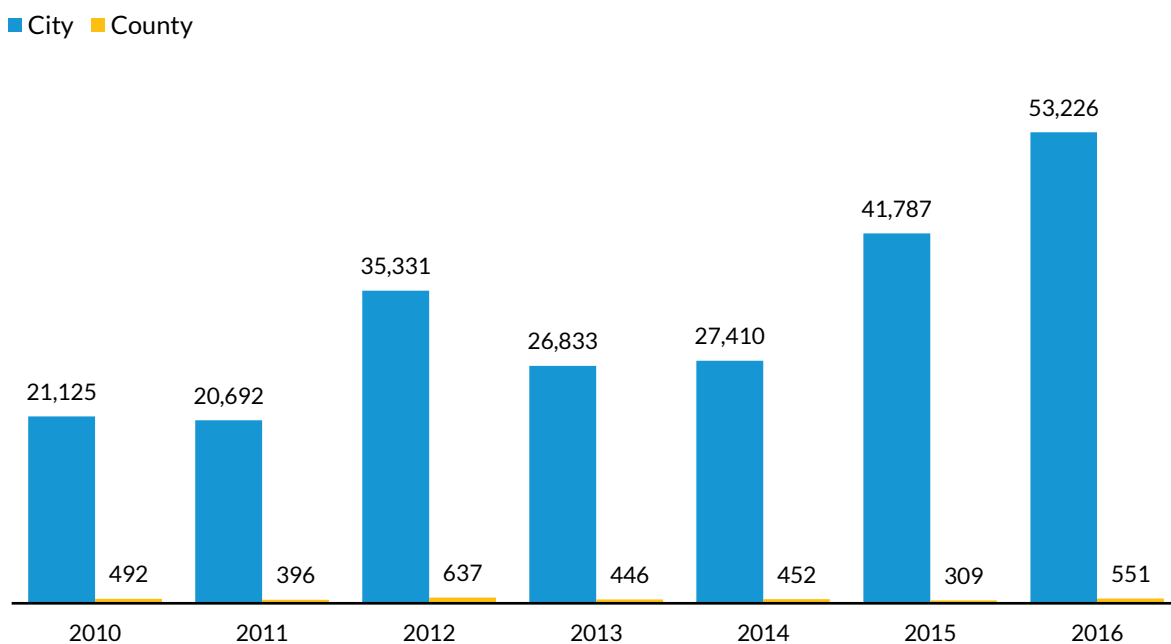
Quantitative Data Analysis

We next analyzed quantitative data from the City Code Enforcement Department and the Shelby County Health Department, supplemented with qualitative interview data, to examine the prevalence and types of code enforcement service requests over time, as well as their relationship to a number of corollary factors.

Code Enforcement Trends over Time

Though both the City of Memphis and Shelby County handle some housing violation service requests, the brunt of the effort is undertaken by the City Code Enforcement Department. In 2016, they dealt with 53,226 service requests compared with the County Health Department's 551. Particularly in the last two years, the City has increased its capacity for handling code service requests, whereas the County's efforts have stayed relatively constant since 2010 (figure 4). Because of this, and because of the richness of the data, we focus most of our analysis on city code department service requests rather than county health department service requests.

FIGURE 4
City and County Code Enforcement Service Requests
2010-16



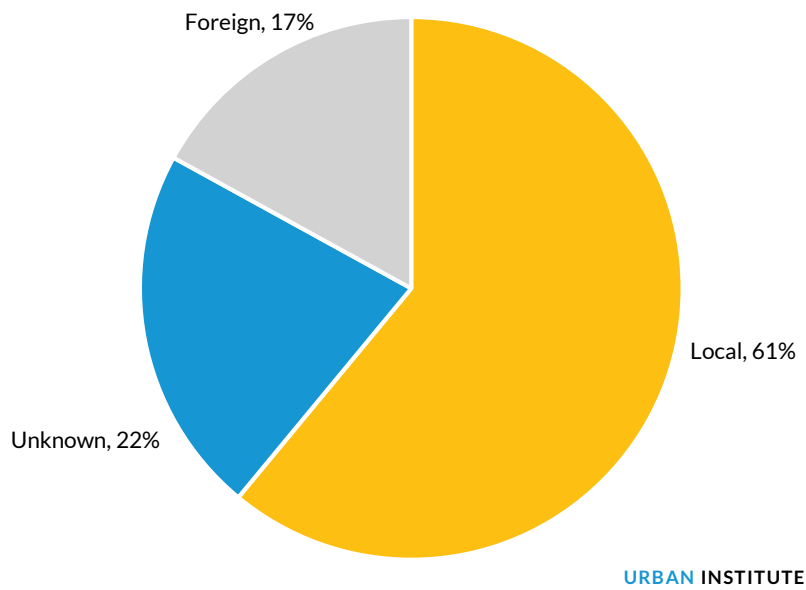
URBAN INSTITUTE

Source: Urban Institute analysis of City Code Enforcement and Shelby County Health Department data.

Violations that end up in court are sent to the environmental court, which saw 1,095 cases in November of 2017, the month in which we collected snapshot data. The top issues that brought cases to court were the Neighborhood Preservation Act (allows for public nuisance lawsuits against owners vacant properties), personal property or junk, failure to comply with orders, overgrown vegetation, and zoning issues. Most of the properties that ended up in court were owned by local landlords (figure 5).

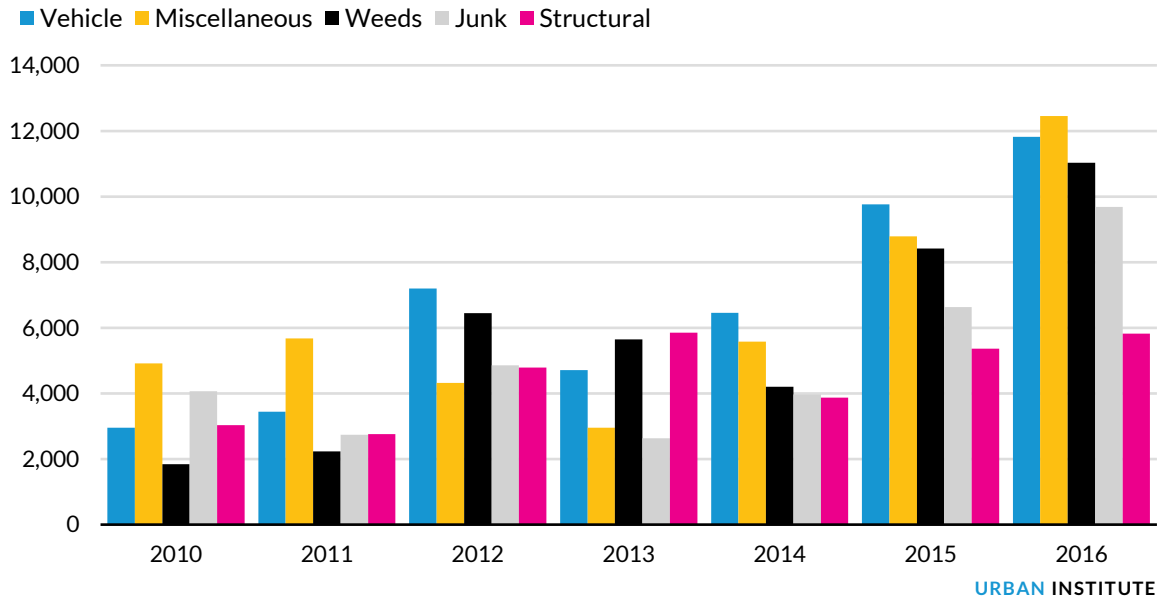
The majority of City Code Enforcement Department activity falls into four categories: vehicular, weeds, junk, and structural issues. Over time, the share of city code citation requests have increasingly dealt with vehicles, weeds, and junk, with less focus on structural building issues. In raw numerical terms, however, 2016 had the second-highest amount of structural citation requests (figure 6).

FIGURE 5
Memphis Environmental Court Cases, by Owner Type
November 2017



Source: Urban Institute analysis of City Code Enforcement data.

FIGURE 6
City Code Enforcement Service Requests by Type
 2010-16



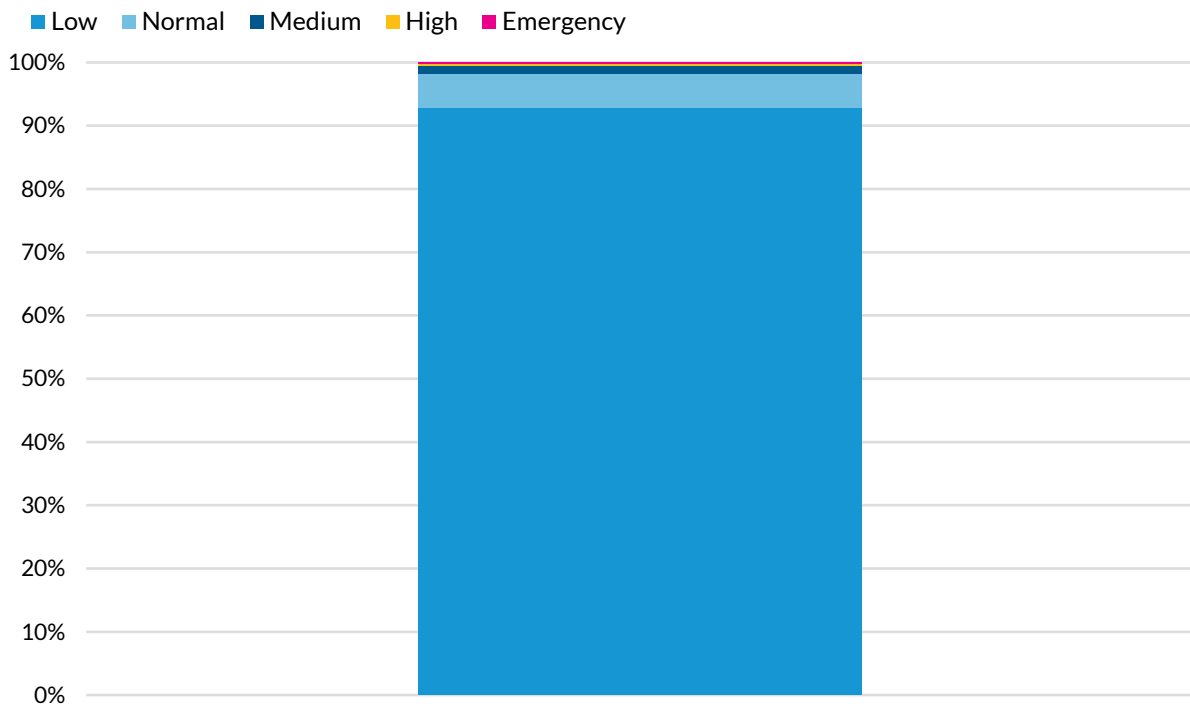
Source: Urban Institute analysis of City Code Enforcement data.

Prioritization of Service Requests

Although the city code department technically has a prioritization schema for service requests, most requests fall into the “low priority” category, indicating that the prioritization system is not frequently used (figure 7).

FIGURE 7

Priority Status of Code Enforcement Service Requests, 2016



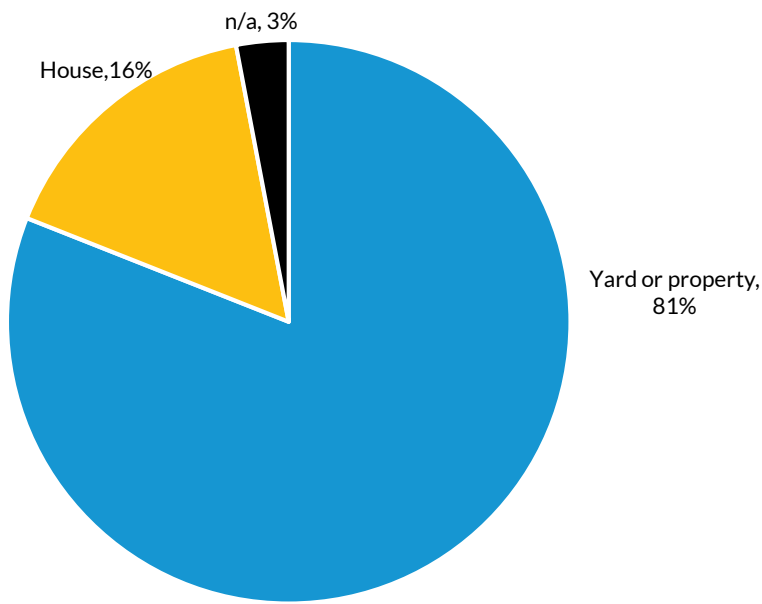
URBAN INSTITUTE

Source: Urban Institute analysis of City Code Enforcement data.

Location of Violations

When examining the location of city code service request violations in 2016, a clear prioritization of external issues emerges. In total, 81 percent of all requests concerned the yard or property rather than the house (figure 8). Furthermore, this distinction holds true across all prioritization statuses—from low to emergency—with a similar percentage in each category for external property and internal house service requests (figure 9).

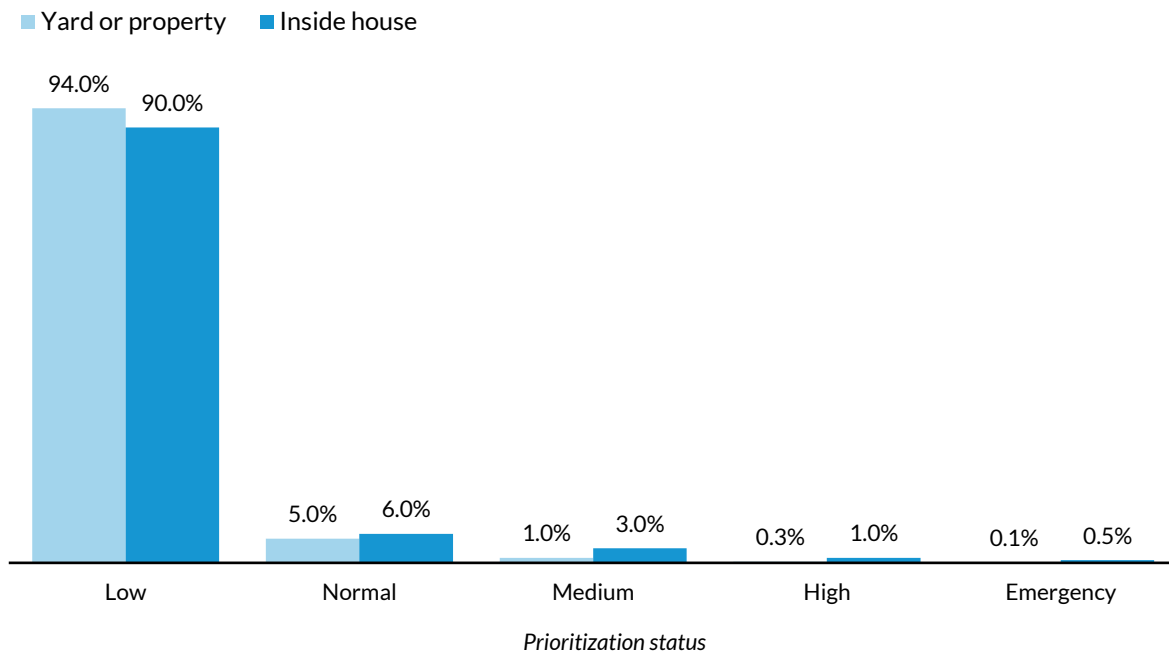
FIGURE 8
Location of Code Enforcement Service Requests, 2016



URBAN INSTITUTE

Source: Urban Institute analysis of City Code Enforcement data.

FIGURE 9
Prioritization by Type of Service Request, 2016



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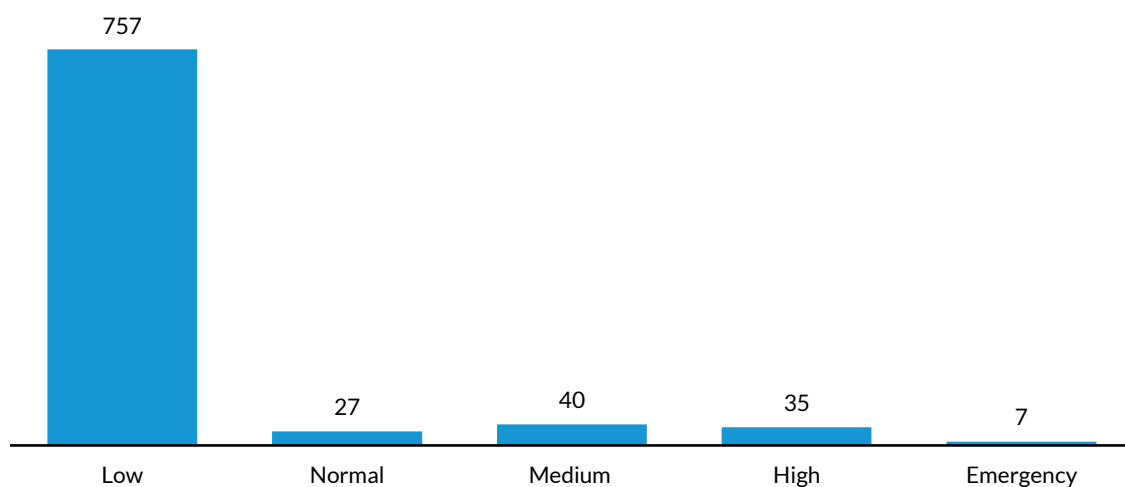
Source: Urban Institute analysis of City Code Enforcement data.

Gaps in Services

Between the Memphis City Code Enforcement Department and the Shelby County Health Department, two key areas of code enforcement currently are not addressed: bed bugs and mold inspections. As bed bugs are not a structural issue they are not expressly covered under the code enforcement department’s jurisdiction, though they can arguably be addressed as an insect infestation. Yet they do not transmit infection diseases, so the Health Department also does not have this issue within its purview (beyond their incidence in hotel rooms).

Mold is comparatively quite expensive to test for and to address when found. Unlike in many other states, there is no statute within Tennessee requiring any agency to take responsibility in addressing mold. A very small proportion of code service requests in Memphis—1.4 percent—pertained to mold in 2015 and 2016. Moreover, mold service requests were overwhelmingly categorized as low priority when they did arise (figure 10). In fact, the Shelby County Health Department’s website directs those needing to resolve a mold problem to contact their physician or to call 911 in the case of an emergency as “Shelby County Health Department CANNOT conduct inspections, clean-up / removals for mold problems, or help with any legal issues in public or private residences.”²⁸ The Shelby County Health Department often provides Memphis residents with the referral phone number for the department of code enforcement despite the fact that the department has explained on numerous occasions that they neither address nor have any policy on mold. Leadership of both agencies expressed a desire for a clear resolution to this challenge as both feel their hands are tied.

FIGURE 10
Number of Mold Service Requests by Prioritization, 2016



URBAN INSTITUTE

Source: Urban Institute analysis of City Code Enforcement data.

Targeting of City Service Requests

We next examined the spatial concentration of city code service requests within Memphis and examined how correlated these requests are with neighborhood characteristics to determine whether the code enforcement department is efficiently and equitably targeting its services (table 4).

However, though conveying a degree of linkage between code requests (on a per capita basis) and various neighborhood characteristics, these data are unable to show whether code specifically targeted these areas because of these characteristics or if these characteristics simply happened to be more likely in areas that also contain housing with code violations. Moreover, housing quality and level of code service requests are not one and the same. Code requests may be more targeted to specific areas for other various reasons (e.g., single-family housing may have more visible issues on sweeps than multifamily buildings or people in some neighborhoods call at greater rates than others).

TABLE 4

Correlation between Neighborhood Characteristics and City Code Requests

Neighborhood characteristics	Correlation with city code requests per unit ^a
Poverty rate	0.46
Percent people of color	0.49
Percent of adults reporting poor mental health	0.53
Percent of adults reporting poor physical health	0.62
Percent of units with two or more substandard conditions	0.27
Percent of units with three or more substandard conditions	0.05
Property offenses	-0.08
Violent offenses	0.12
Percent multifamily units	-0.50
Percent single-family units	0.51

Sources: Urban Institute analysis of Memphis City Planning Department data, Shelby County Health Department data, Centers for Disease Control and Prevention 500 Cities data, and US Census Bureau American Community Survey, 2011–15.

^aThroughout these analyses, we use 2015 code enforcement data for the purposes of standardization, as the latest year of crime data and 500 cities data available is 2015.

Figure 11 displays the poverty rate by census tract in Memphis in blue and the density of code service requests in yellow. Neighborhoods with higher poverty rates are associated with higher rates of code service requests per housing unit. Areas with a higher share of residents below the poverty level often also contain lower housing quality (per the Census Bureau definition). In this sense, these areas may be important to target for code service requests, particularly where landlords may not be responsive to tenant requests because of power dynamics (Dillahunt, Mankoff, and Paulos 2010; Keller 1988; Poppleston 1972; Vaughan 1968).

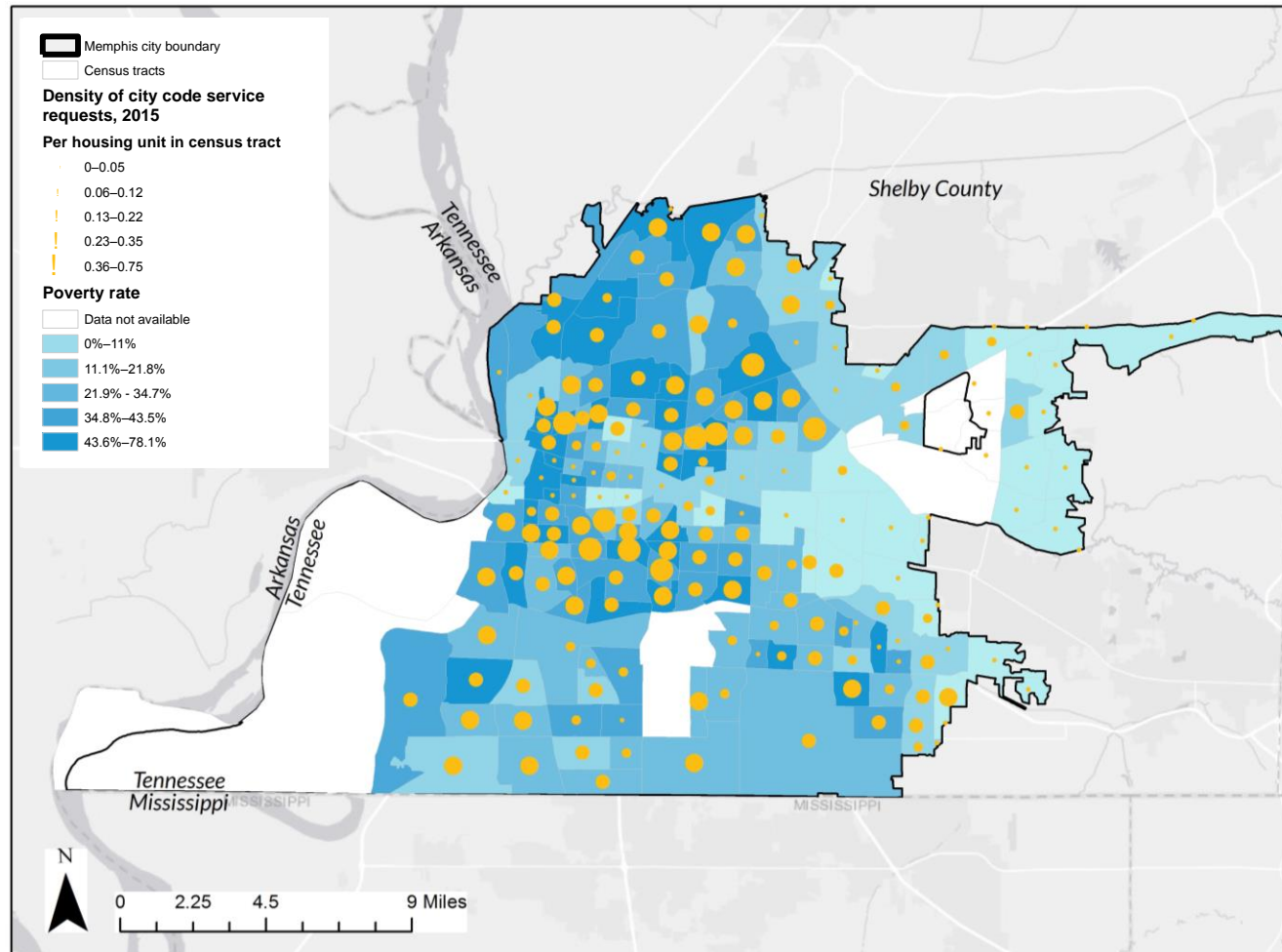
A census tract's share residents of color²⁹ is also closely related to its density of service requests (figure 12), perhaps because of the concentration of substandard housing in neighborhoods with high percentages of people of color. This is most evident in the area just south of downtown Memphis.

There is only a slight correlation (0.27) between service requests and the percentage of units with two or more substandard conditions (figure 13), and an even lower correlation between service requests and the percentage of units with three or more substandard conditions (table 4). Since this metric is calculated using self-reported resident data (across four conditions: lack of complete plumbing facilities, lack of complete kitchen facilities, more than one occupant per room, and housing cost in excess of 30 percent of income), it might be expected to have a stronger geographic relationship to areas strategically targeted for code enforcement. Considering housing conditions, north and southeast Memphis appear to have fewer service requests than might be expected.

Of all the measures, adults reporting poor mental health and poor physical health held the strongest geographic relationship to density of code service requests (figures 14 and 15). This suggests either code enforcement is targeting areas with high health need or that high health need is associated with buildings not up to code. However, this targeting could be even stronger as evidenced by census tracts that still have high rates of poor mental and physical health and low rates of code enforcement, if these conditions are related to housing. Additional data on the types of conditions residents face at small geographies over time could greatly improve the targeting of code enforcement to areas most in need. Also, what a code enforcement intervention means for health should be explored—the mere response to a call in a geographic area does not necessarily have a positive health impact. But perhaps it should, using strategic code enforcement.

FIGURE 11

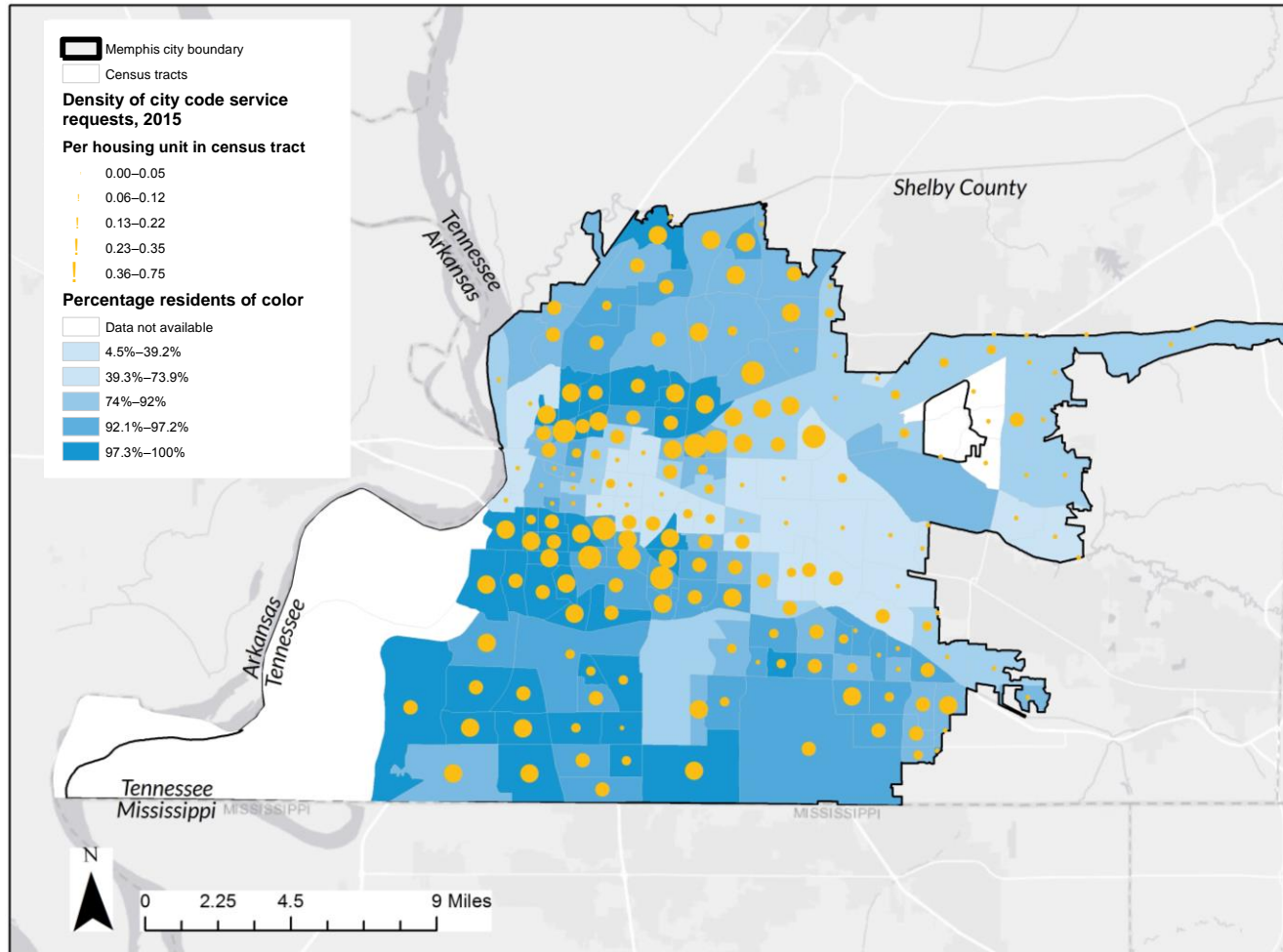
Density of City Code Service Requests and Poverty Rate



Sources: Urban Institute analysis of Memphis City Planning Department data and US Census Bureau American Community Survey, 2012–16. Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community.

FIGURE 12

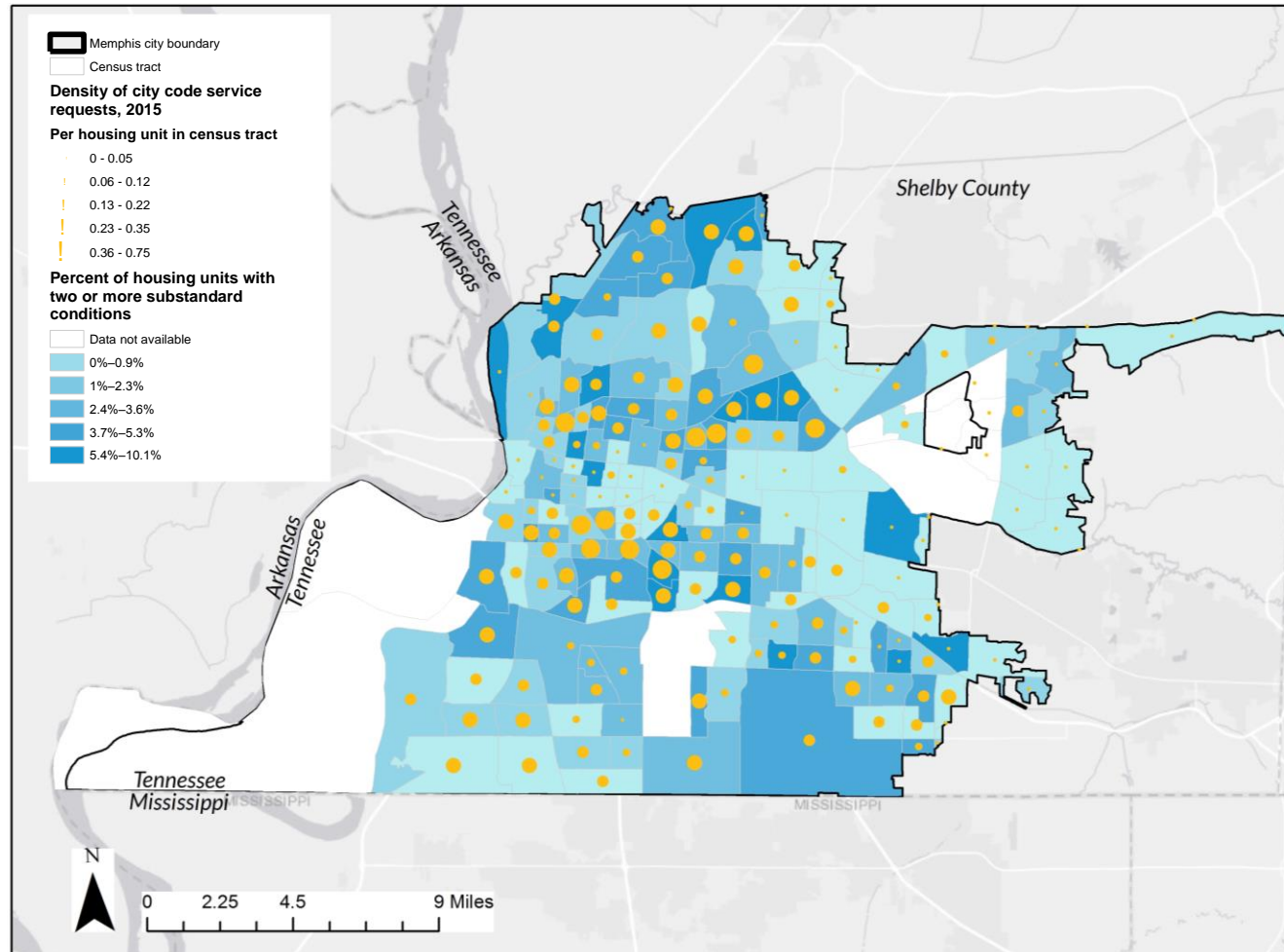
Density of City Code Service Requests and Percent Residents of Color



Sources: Urban Institute analysis of Memphis City Planning Department data, and US Census Bureau American Community Survey, 2012–16. Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community.

FIGURE 13

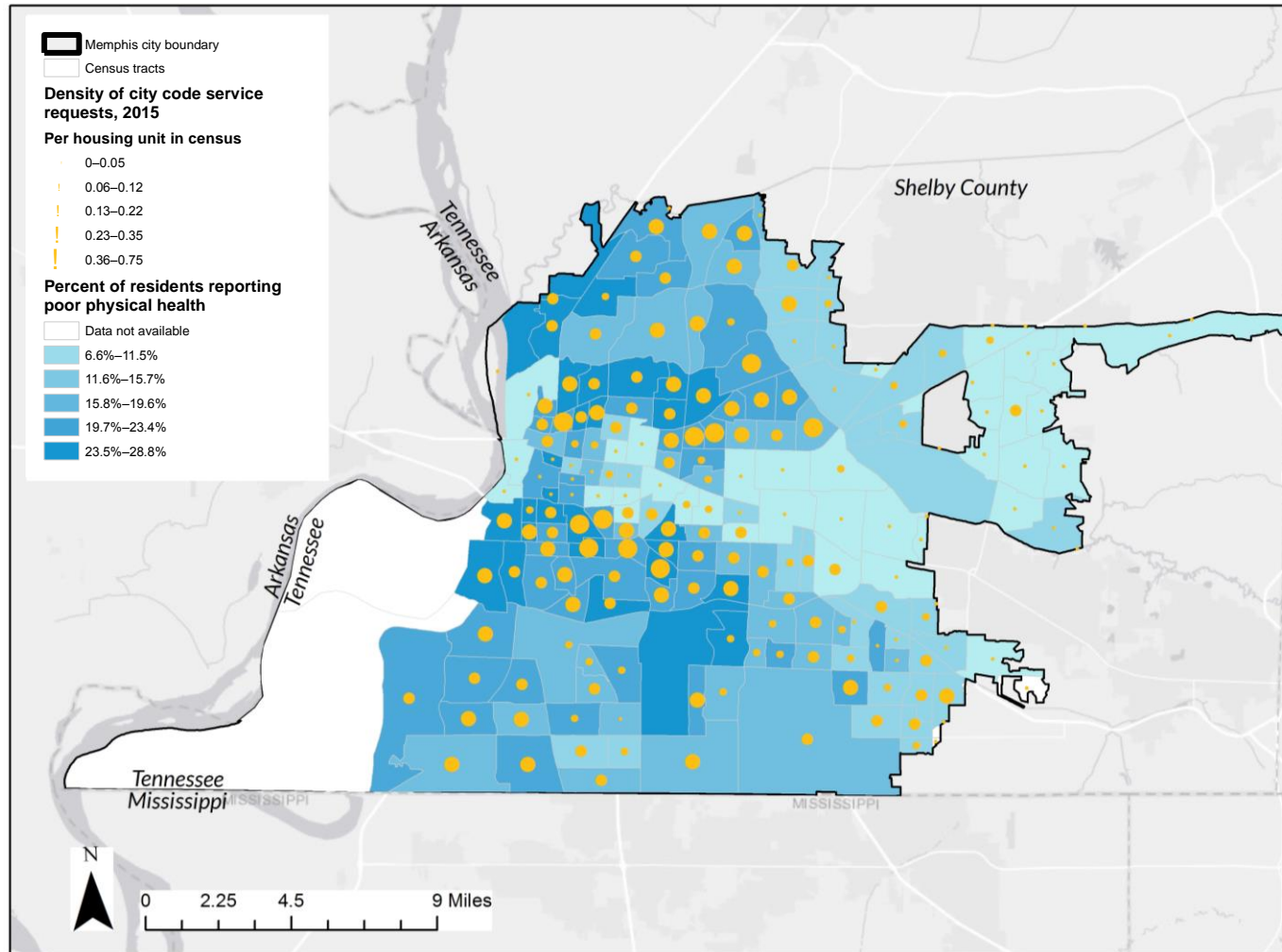
Density of City Code Service Requests and Substandard Housing



Sources: Urban Institute analysis of Memphis City Planning Department data, and US Census Bureau American Community Survey 2012–16. Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community.

FIGURE 14

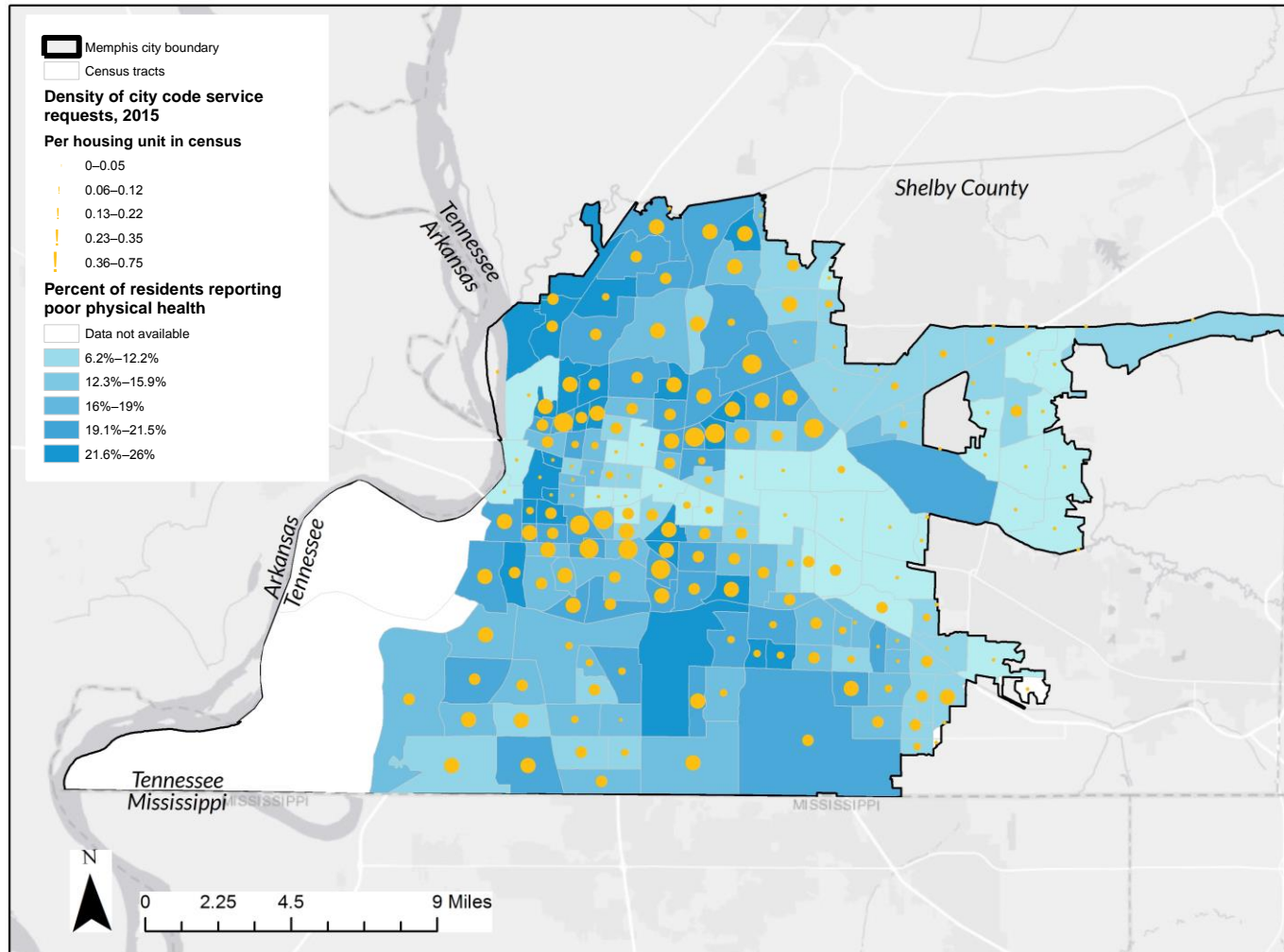
Density of City Code Service Requests and Poor Physical Health



Sources: Urban Institute analysis of Memphis City Planning Department data, and Centers for Disease Control and Prevention 500 Cities data. Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community.

FIGURE 15

Density of City Code Service Requests and Poor Mental Health



Sources: Urban Institute analysis of Memphis City Planning Department data, and Centers for Disease Control and Prevention 500 Cities data. Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community.

Crime, on the other hand, is not highly correlated with City Code Enforcement Department service requests. The prevalence of violent offenses does not strongly correlate (0.12) with density of service requests in a given area (figure 16). Number of property offenses within a census tract is even less related, with a small negative relationship to density of code service requests. This could be because the City Code Enforcement Department is not targeting their services well, because their services are causing reductions in crime, because people have given up calling code enforcement, or because people are scared to call because of the prevalence of crime. Additional research should be undertaken to determine the causal relationship.

By area, code enforcement is concentrated in areas with greater percentages of single-family homes (figure 17). Although about half of all city code service requests are for multifamily units,³⁰ most of these (70 percent) are duplexes rather than larger apartment complexes. Making up only 3.1 percent of all units in the city (table 5), the focus on duplexes is markedly disproportionate to their overall share of the housing stock. This phenomenon may partially be explained by the historic lack of clarity as to whether the City Code Enforcement Department has jurisdiction over multifamily units. Additionally, the majority of cases that went to environmental court in November of 2017 were for single-family homes (figure 18), and most were vacant.

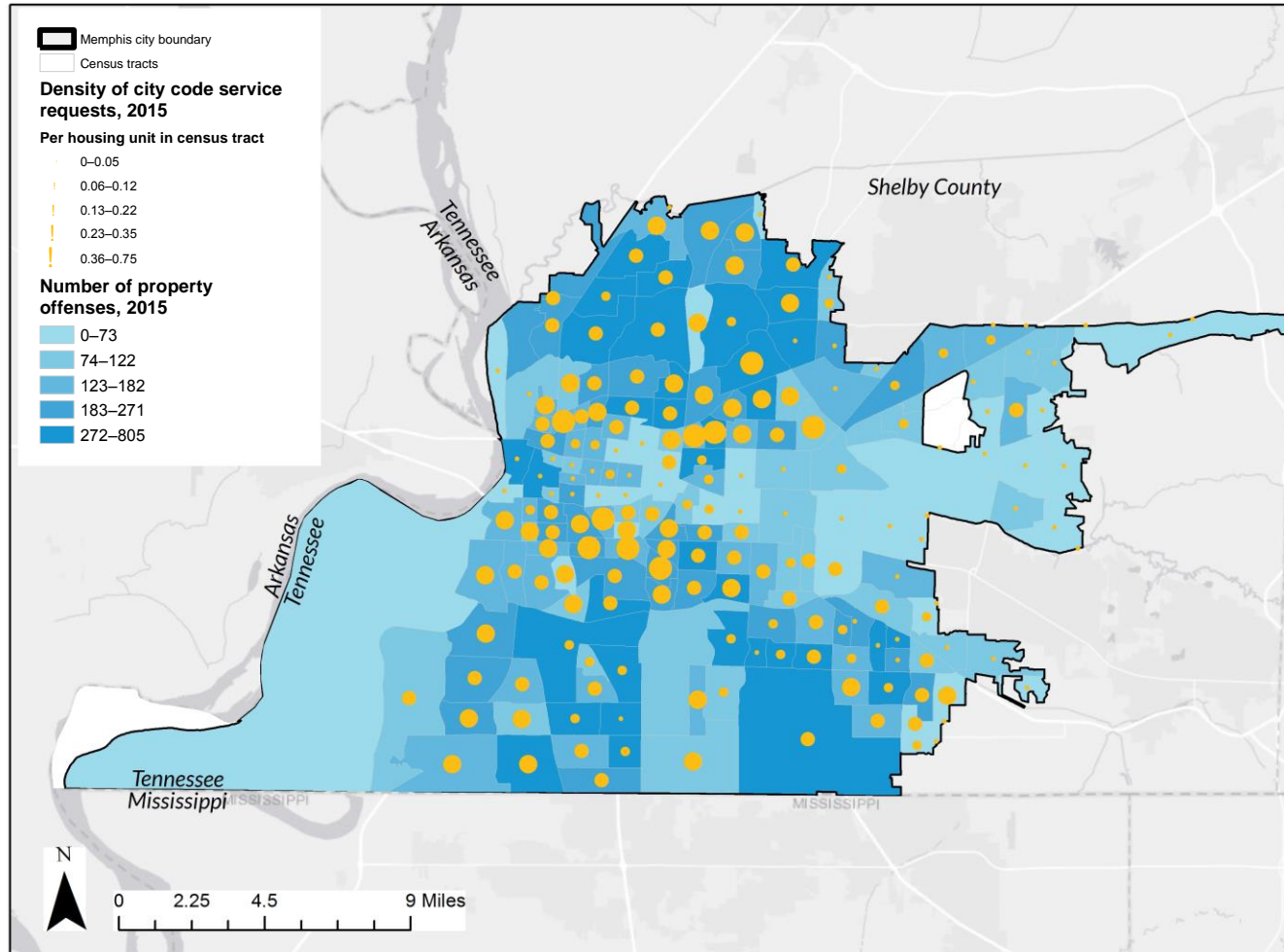
TABLE 5
Housing Structures by Number of Units for the City of Memphis

Units	N	Share
1	194,531	65.3%
2	9,248	3.1%
3 to 9	50,649	17.0%
10 to 19	19,883	6.7%
20 to 49	7,026	2.4%
50 or more	13,662	4.6%
Mobile home	2,872	1.0%
Boat, RV, van	84	0.0%

Source: American Community Survey, 2011–15.

FIGURE 16

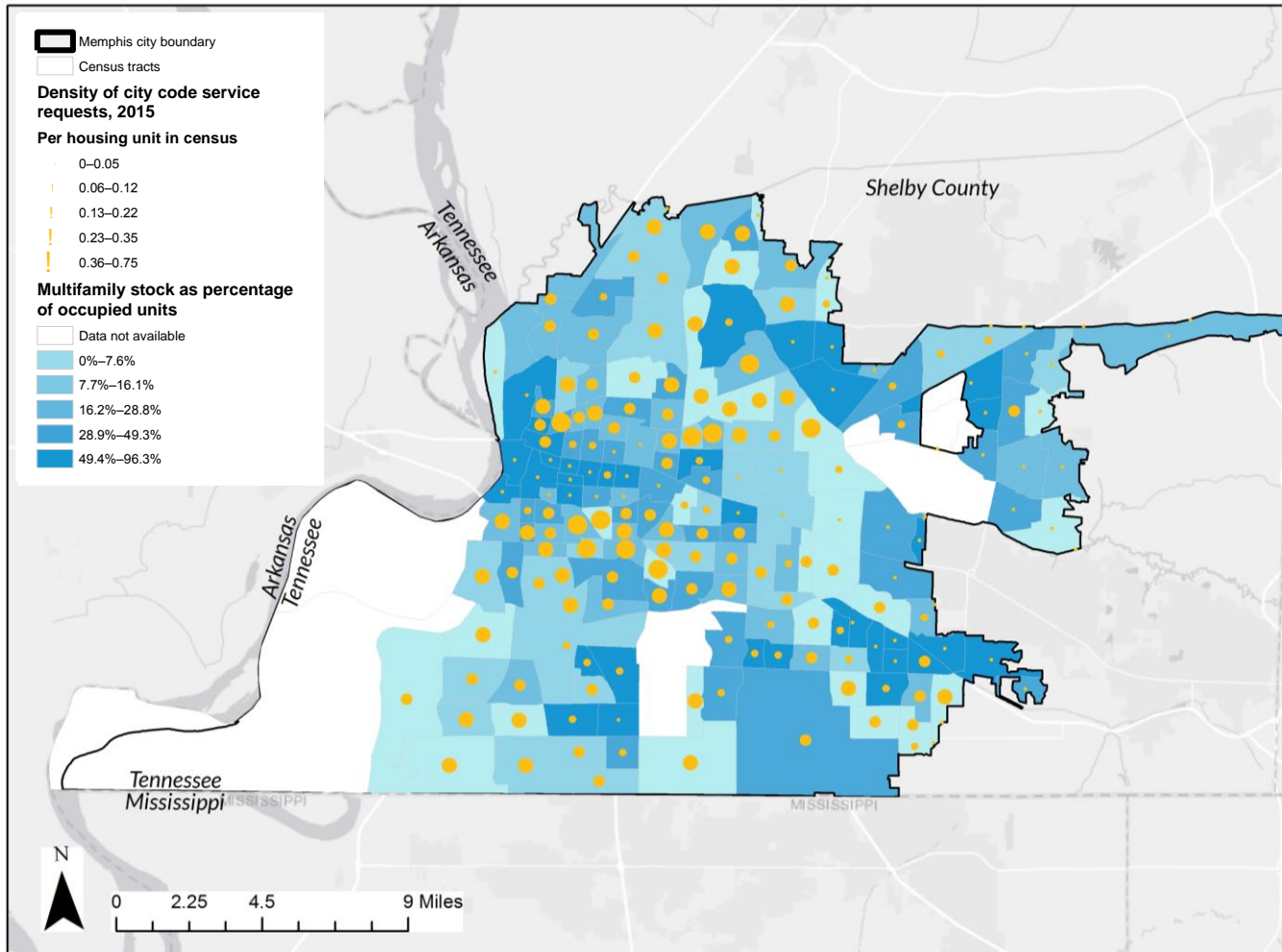
Density of City Code Service Requests and Violent Offenses



Sources: Urban Institute analysis of Memphis City Planning Department data, and Memphis City Police Department data. Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community.

FIGURE 17

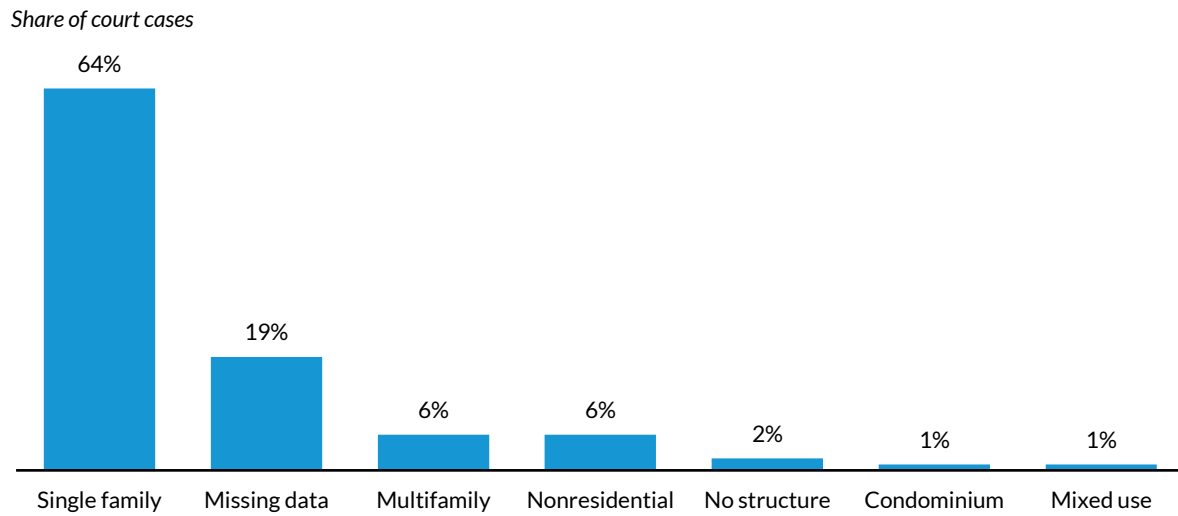
Density of City Code Service Requests by Share of Multifamily Stock



Sources: Urban Institute analysis of Memphis City Planning Department data, and US Census Bureau American Community Survey 2012–16. Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community.

FIGURE 18

Memphis Environmental Court Cases, by Property Type, November 2017



Note: N = 1,095 cases.

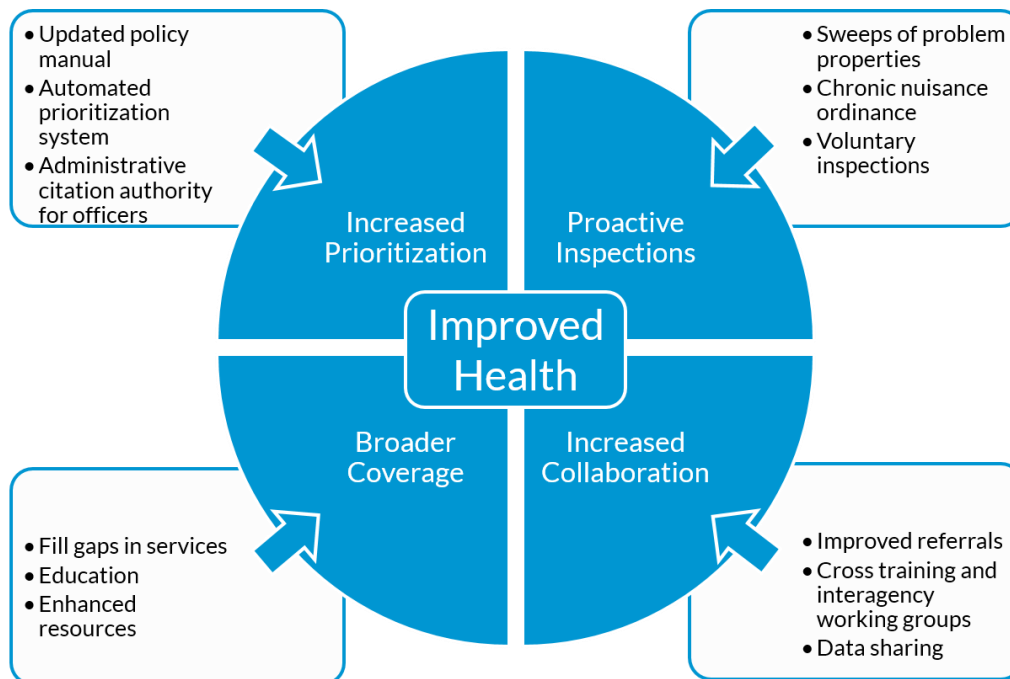
Recommendations for Policy and Practice

A number of ideas and insights have emerged from this HIA regarding ways in which code enforcement in Memphis can be more strategic to improve the public health of residents living in or near substandard housing (figure 19). These recommendations fall into four buckets: increasing prioritization of service requests, expanding coverage of code enforcement services, making the inspection process more proactive, and increasing coordination and collaboration between city code, county health, the environmental court, and a number of other health, housing, and financing organizations.

In this section, we detail these recommendations and lay out a call for action for putting them into place.

FIGURE 19

Recommendations for Better Targeting Health through Code Enforcement in Memphis, TN



Increased Prioritization

Code enforcement practices and processes in Memphis could become more strategic by adopting and institutionalizing a prioritization of service requests that places emphasis on requests more closely related to negative health outcomes. The intake and referral systems for the city and the county should prioritize violations that affect both the immediate safety of residents and the longer-term health of residents and their neighbors, with a particular emphasis on the internal conditions of the apartment or house.

Although HCE has a prioritization system in place, the practice seems to vary from inspector to inspector. Inspectors are assigned to geographic sections of the city, and each inspector addresses requests within their section each day using a tablet that shows the location and details for each request. The City HCE agency is in the process of adopting a new, comprehensive policies and procedures manual, which recommends prioritizing service requests and actions based on the imminent threat to the public's health and safety. This prioritization system should take into account the potential impact of the violation on the immediate health and safety of the resident and the longer-term health of both the residents and their neighbors. In addition, the prioritization system should be automated so that cases are automatically prioritized for inspectors when they head out for the day.

Prioritize Service Requests inside the Unit

Most citizen service requests are related to junk in the yard or other external violations and do not require the inspector to enter the property or building. This is likely because these violations are more visible both to inspector and to neighbors who are often the sources of such violation reports and because of legal and policy issues of access surrounding internal inspection.³¹ However, many of the more serious health related code violations occur inside the house, such as mold, lead, heat and cooling issues, ventilation problems, and other structural issues within the unit. Although some external property conditions, such as harborages for rodents and mosquitoes can create health issues for residents and the neighborhood, they appear to be consuming most of the code department's time and resources, with little left over for more serious property condition violations.³² Working with their legal counsel and the environmental court, HCE should review the legal, policy, and staffing dimensions of this issue and consider prioritizing internal violations that have a stronger relationship and association with negative health outcomes above the external violations that are often related to neighborhood order and aesthetics along with the process and procedures for quickly obtaining inspections warrants when necessary.

Once adopted, these procedures must be put into practice in the daily prioritization of service requests. For example, the new HCE policies and procedures manual should have a section devoted to prioritization of service requests. This new prioritization inspection policy should coordinate with how other city agencies prioritize their inspection of residential and commercial properties and structures. A critical step for establishing a cross-agency inspection process is to have the data system search for key words within a request and automatically prioritize violations that are likely to be related to negative health outcomes. Then, the requests could be listed in order of priority and inspectors could begin each day at the units with the highest priority and work their way down. Within this system, we recommend that enforcement be focused first and foremost on the maintenance of a habitable rental stock, considering the cost barriers to repair low-income homeowners face.

Providing Inspectors with Administrative Citation Authority

Another policy change that could help improve prioritization of requests and make the code enforcement process more efficient would be to consider enacting a local ordinance or taking other necessary steps to empower housing code inspectors to issue administrative tickets or citations for exterior violations of the property maintenance programs. Allowing HCE inspectors the authority to issue citations that impose small civil fines for minor violations could help Memphis reduce the number of times that they have to return to a home to ensure that the violation has been addressed and save HCE time for more serious cases. Right now, HCE inspectors do not impose fines or take any type of enforcement action against an owner for ignoring a violation other than citing owner to the Shelby County Environmental Court,³³ which can be an inefficient way to deal with minor violations. Providing citation authority could, in theory, free up inspection resources that could be redirected to conduct proactive sweeps and focus on more serious cases. HCE should consult with its legal counsel to determine if it has the home-rule powers to enact a local ordinance or if it will require state authorizing legislation. As it explores the right legal vehicle, Memphis should consult with other cities to learn about important the resources, management, and staffing capacities that are necessary to run an effective program, including the due process requirements for appeal and review of such citations. Code enforcement program in Detroit, Baltimore, and New Orleans have robust administrative citation and hearing programs that cover a variety of housing and property code violations and could provide important lessons for Memphis.

Prioritize Neighborhoods with Concentrations of Substandard Housing

One final way that the department might better prioritize their services would be to target neighborhoods with higher rates of substandard housing, crime, and poor health conditions and potentially target large multifamily properties. The data suggest that areas in North Memphis and Southeast Memphis in particular are underreported considering the housing conditions issues. A core tenet of strategic code enforcement is to tailor the right intervention for the right place at the right time as some properties in some neighborhoods demand a different level of code enforcement action.

Perhaps a good place to start is to use neighborhood-level data and indicators to track the relationship of housing code cases and health conditions over time and then develop a policy that could assign code enforcement services to areas in need. Some of the important code data points might include the geographic location of service requests, the type of services requests and the types of property, the number of inspections, and the type of enforcement actions taken (e.g., the geographic mapping of all environmental court cases) so that city officials and the community have a better sense of the allocation of resources. Geographic targeting of code enforcement services should also coincide with the neighborhoods' priorities found in relevant planning documents. It would also behoove city officials and HCE agencies to talk with local residents to understand neighborhood priorities and concerns.

Broader Coverage

Memphis's City Code Enforcement Department could also benefit from expanding their coverage to properties currently overlooked by the system. This could be done by filling in gaps in services, increasing resources for enforcement and repairs, and educating residents about healthy homes and code enforcement services and code inspectors about healthy homes.

Fill Gaps in Services

Gaps in services must be addressed to ensure coverage of all homes and property induced illnesses in Memphis. Specifically, local code enforcement laws and processes need to be updated to address bed bugs, mold, and lead-based paint. Unlike in many other states, there is no statute within Tennessee requiring any agency to take responsibility in addressing mold. And, the lack of clear jurisdiction around bed bugs prevents inspectors in either department from addressing them. As one key stakeholder put it, "The beginning and end of what inspectors think they can do anything about is what's covered by the code. If it's not covered by the code, they're not going to do anything about it."

In addition to updating the laws relating to bed bugs and mold, the city should develop a written protocol that outlines the lead agency for a variety of property conditions that pose threats to health of residents. This is part of adopting strategic code enforcement.

Education

Enhanced education for both residents and code enforcement inspectors could also help to expand coverage of code services to areas not already served by the code department or other agencies.

Residents are often unaware of the actions undertaken by city code enforcement and the county health department and the rationale for how and why they inspect, investigate and file enforcement actions. Educating the public about these fundamental code enforcement roles and responsibilities could increase the reporting rate for violations and increase opportunities for people to advocate for themselves. However, this will not increase reporting rates for tenants who are afraid to report for fear of eviction, which is why the increased tenant protections noted below are also necessary.

Educating residents about how to keep their homes healthy could also help to improve the public health of Memphians and potentially reduce the need for code enforcement. Crocker and colleagues (2011) find that infrastructure interventions combined with educational and behavioral interventions are more effective than either intervention alone at reducing emergency room visits and hospitalizations. For example, Memphis could undertake a social marketing campaign that seeks to educate the public about the potential health and quality of life threats that substandard rental housing pose to tenants and to the stabilize of surrounding neighborhoods. As part of this strategy it would also be strategic to ensure that good landlords are recognized for maintaining their properties. This could be done through a good landlord training program as they have in Minneapolis or through annual awards for those owners who have renovated substandard rental properties.

Increased education for code inspectors of the potential health implications of various violations could also help them to identify and prioritize cases more likely to cause negative health outcomes. de Leon and Schilling (2017) recommend inclusion of mold, smoke, and leak training to code enforcement inspectors to better identify asthma triggers.

Training for health care providers about housing related illnesses would also be beneficial. Particularly useful would be training for providers on how to identify a housing related illness and whom to refer patients to when such an illness arises. Home health providers could serve a vital role, with proper training that allows them to advise tenants on common home health hazards.

Enhanced Resources

A more strategic code enforcement also requires increased investments in repairs since, for instance, mold is also extremely costly to remediate. Through interviews with stakeholders across the health, housing, and code enforcement sectors, it became clear that limited funding for health and housing interventions creates a barrier to improving the Memphis housing stock. Though Memphis is the recipient of federal and state housing and community development funding, these available public resources are not sufficient to tackle the issues of blight and substandard housing citywide. Many of these housing programs focus on development of new, affordable housing and not on the rehabilitation and repair of dilapidated houses and apartments. As one stakeholder put it, “When services are needed that exceed the value of the home, where does the family go[?] The cap on matching funds from [one program] is \$5,000, which is less [than] a new roof. Everyone is here [at the table], but nobody has any money.”

The city should explore innovative ways of financing these enhancements, such as the formation of a dedicated revolving loan fund or a housing trust fund to provide grants to homeowners and low interest loans to landlords for repairs. For the past year, the City’s Division of Housing and Community Development, BLDG Memphis, NPI, and other local organizations have been working on a draft housing trust fund that could provide resources for rehabilitation and repairs. Another potential source of revenue for a special repair fund is a vacant property tax.³⁴ Some cities have also funded their housing and code enforcement operations through increases in real estate transfer taxes or fees. Part of the challenge with any funding strategy is some part of the fee or tax must also cover program management and staffing. From what we have found in the literature and experience from other cities, program administration is often one of the greatest challenges to the effectiveness of a vacant property tax or other revenue source.³⁵ However, before implementing any type of fee or tax-based system, a research study should be undertaken to ensure that there are no unintended negative consequences for equity in the city.

Many of our other recommendations also require increased funding for expanding code enforcement capacity. For instance, becoming a visible and proactive force within the community through increased neighborhood outreach and community education about code enforcement’s role and responsibilities with health and housing would likely require more inspectors than the City Code Enforcement Department and county health department are able to support. These agencies would also likely need additional general support along with better data analysis, management, and IT capacities. And, some of the health-related violations that are not currently addressed are extremely costly to test for, such as mold. Better prioritization and more efficient use of resources would help them get there,

but additional funding is also likely necessary for things such as training and technical assistance in helping design and launch more proactive targeting of public health conditions.

These increased investments could, in theory, be recouped by reduced health care costs, reduced crime, and increased property values and economic vibrancy in neighborhoods. The challenge is identifying the cost shifting by sector as the cost savings to local government may not be as great as the potential cost savings to health care providers and health care insurers. Such cost shifting must be carefully analyzed as any viable funding proposals will require collaboration and coordination across sectors and agencies. One emerging model within the field of social impact investment is through a “pay for success” financial structure where the agency that saves money could be asked to pay investors for the cost of savings. Kersten and colleagues (2014) argue that significant investments should be made in infrastructure repair for the sake of spending reduction for acute care services. When evaluating redeveloped public housing, they find that children living in non-redeveloped public housing are 37 percent and 39 percent more likely to have a repeat visit to an emergency room after an initial visit than children who lived in nonpublic housing and children who lived in redeveloped public housing, respectively. Promising recent work at the Regional One Health in Memphis demonstrates that providing as little as \$500 for housing of housing-insecure uninsured patients can save tens of thousands of dollars in health care costs.³⁶

Proactive Inspections

Another way Memphis HCE could be more strategic is if they conduct proactive inspections of problem properties. de Leon and Schilling (2017) argue that the complaint-based system of most code enforcement agencies frequently overlooks asthma-related triggers, such as mold, smoke, and leaks, because the mechanism of trigger-induced asthma is a less obvious threat to health and safety. Inspectors’ legal authority rests with the adopted housing and property maintenance codes that govern physical conditions related to safety with less emphasis on health.

Memphis HCE should undertake comprehensive and systematic sweeps of problem or high-risk properties, particularly ones that are under covered by the current system. This would also help inspectors catch conditions that may not otherwise have been reported by a tenant or neighbor, further expanding their coverage. But such sweeps must be followed up with timely and effective enforcement actions. HCE has done a handful of code sweeps involving large multifamily complexes, such as Global Ministries case,³⁷ but HCE currently does not have a cohesive, criteria-based policy that outlines the procedure for proactive sweeps of problem properties, such as repeat offenders.³⁸

Many cities, even large cities, such as Minneapolis and now Detroit and Fresno, deploy a regulatory approach by requiring regular registration and licensing and then inspection of rental units.³⁹ Senior fellow at the Center for Community Progress Alan Mallach (2015) outlines strategies for developing an effective rental licensing program while providing landlords with incentives and technical assistance to maintain properties and minimize their rental registry costs. Adoption and later administration of rental licensing and inspection ordinances often become controversial with strong opposition and resistance from property owners and regional associations of apartment owners and landlords.⁴⁰ However, establishing threshold property standards, maintaining property standards over time, covering regulatory costs, and imposing penalties could still help prevent rental properties from becoming substandard (Mallach 2010).

Memphis is considering another approach, the adoption of a chronic nuisance ordinance that would require comprehensive, unit-by-unit inspections, paid for by the property owner, only at properties with a consistent track record of severe and unresolved housing code violations. This ordinance could be the legal impetus for Memphis to proactively address problem properties and enhance coverage but would not divert limited inspection resources to properties known to be in good condition.

Proactive enforcement actions triggered by any of these regulatory approaches could lead to increased rent as the landlords and owners pass the repairs costs on to the tenants; as with any code enforcement action, there is a risk of displacement. Cities such as Memphis should put in place procedures for minimizing the risk and for mitigating the impacts from displacement. Other cities have extensive collaborations with other public and nonprofit partners that assist with temporary and permanent relocation. Updating state laws to better balance protections for tenants could help to reduce the chance of negative unintended consequences from the proactive enforcement inspections and actions. Some experts argue for just-cause eviction policies to limit profit-driven evictions. These protect tenants from landlord harassment following code inspection and enforcement, which encourages reporting in cases of neglect. Together these two approaches could help to reduce the risk of evictions and perhaps also help to increase rates of reporting to code enforcement by decreasing fear of eviction by residents.

Increased Collaboration

Code enforcement in Memphis could also more strategically target health if they increased collaboration between code enforcement departments and public, private, and nonprofit organizations such as health care providers, public health agencies, and housing financing groups. Increased

collaboration could reduce duplication of efforts, fill gaps in services, and increase use of available resources by residents. This could be accomplished through improvements to the referral systems between agencies, health care organizations, and nonprofits, cross training of inspectors from different departments, and improved data-sharing systems. Such cross-sector coordination is a key goal of the HHP and GHHI.

Improving the referral system between agencies, nonprofits, and private organizations could help homeowners, landlords, and renters have access to resources when issues arise. For instance, having a functioning and updated referral system could help code enforcement inspectors, put homeowners in touch with organizations that provide grants or financing to fix violations. The referral system could also refer residents to health care facilities for various health-related illnesses, and to the county health department for help with violations under their jurisdiction. As it stands, Memphis and Shelby County do not have written protocol that outlines when, where, and how inspectors from county health and HCE agencies refer cases to each other or, more importantly, that identifies which agency will take the lead. For instance, vector control in the county health department does not always notify the code department even if they suspect additional violations to the interior of a home they are inspecting, they leave reporting up to the resident. A written protocol adopted by both agencies could become part of HCE's pending policies and procedures manual.

This referral system could be part of a larger combined data system that city code, county health, and other city agencies use. It could also be developed into a phone application that allows inspectors to connect residents to nonprofits and other organizations. Preferably this process could make use of existing software and hardware tools within each agency.

Better coordination with nonprofits and other organizations would also help code enforcement more strategically address health related concerns. Better connections with CDCs, tenant organizations, and health care organizations in particular would help the code department better understand the nature of the substandard housing in each neighborhood and how it connects to health outcomes. In other cities, hospitals have set up referral systems where doctors can refer patients to other community agencies to tackle health issues stemming from housing. For instance, Children's Mercy Kansas City has an asthma management program in which patients can be referred to community services to eliminate mold or pest infestations in their household.⁴¹ Home health providers could also serve this need, with proper training, elevating housing-related issues that contribute to health problems and either advising residents or providing necessary referrals.

Better linkages between various data systems would also be useful, such as the sharing of information between the City Code Enforcement Department and county health inspectors so that each knows when the other has received a request at a particular property. The collection and sharing of information between the environmental court and city and county officials would also be useful, so that they can keep track of the progress of each case. If a central data system is not possible in the short run, the various departments should at least share data on a regular basis more informally.

Data systems that share information between housing and health care organizations would also be beneficial, such as an automatic way that a doctor can inform HCE agencies if they believe that a patient's illness is housing related. Other cities, such as Boston (Reid et al. 2014), have implemented such systems, but the structure of Memphis's hospital systems and data suggest that this is a long way off for Memphis. However, the city should work toward this as a long-term goal. In the short term, the City Code Enforcement Department should set up more direct contact with health care providers to learn about neighborhoods and/or housing complexes that may be in direct need.

Another way that Memphis could increase cross-sector collaboration is through cross training of inspectors with other city employees, such as city code inspectors with county health inspectors, as well as public housing inspectors from the Memphis Housing Authority and lead inspectors from the City Division of Housing and Community Development. Thanks to a grant from the Kresge Foundation to NPI, the first step in such cross-training is being implemented through a city-county healthy homes training that will take place in the fall of 2018, cosponsored with HHP. The creation of new and strengthening of current cross-agency working groups, perhaps as part of the Blight Elimination Steering Team, would also help to increase collaboration and coordination not only between the two departments, but with other public agencies and nonprofits that are involved in Memphis's broader network to address substandard and blighted properties.

Call to Action

Strategic code enforcement has the potential to greatly improve population health in Memphis and in other cities. Making health outcomes a priority of code enforcement would help to better align goals across agencies and ensure that resources are being used most efficiently. A single call for help to the City Code Enforcement Department should result in improved health for the caller in many cases.

To do this, we urge city stakeholders to consider the following:

- Create a prioritization system that puts heavier weight on health-related violations and interior health and safety issues.
- Enforce this prioritization through adoption in the housing code enforcement policies and procedures manual and through automatic prioritization in the city's data system.
- Develop a neighborhood typology that will allow for strategic code enforcement coverage that fits the unique needs of different areas in Memphis.
- Fill in gaps in inspection, investigation, and enforcement coverage through updates to local and state laws, specifically for bed bugs, lead-based paint and mold, and develop a written protocol outlining which agency is responsible for each type of violation.
- Increase education, awareness, and training, both for residents regarding health-related housing issues and code enforcement services and for code inspectors regarding healthy homes.
- Identify ways to enhance resources available, both for expanding code coverage and for repairing health-related violations in homes.
- Institute a formal system of proactive sweeps of problem multifamily properties and neighborhoods and of neighborhoods that are underserved and in need.
- Review the landlord and tenant laws and procedures to determine whether they provide needed protections and remedies to promote and protect health and housing habitability standards.
- Increase coordination and collaboration between code enforcement, the environmental health department, and other organizations that touch on housing and health to reduce duplication of services, fill in gaps in services, and secure adequate funding and resources.
- Consider synchronizing the data systems of the Memphis City Code Enforcement Department, the Shelby County Department of Public Health, and the environmental court (among others) so that data are shared in real time.
- Use real-time data to deploy strategic interventions.

Further Investigation

Throughout the HIA process, our research team identified a range of potential data, policy, and program questions that would require further investigation. These questions could evolve into independent

research projects that examine different health and housing variables and potential outcomes in Memphis at different scales. From the outset, our team recognized the HIA framework would enable us to examine a broad range of health and housing relationships and issues but that we would not have sufficient time and resources to thoroughly answer. Below we discuss a few potential research questions for future study in Memphis and in other cities struggling with substandard housing and code enforcement.

First, each of the individual recommendations above warrants more in-depth analysis and review before being implemented to ensure that it will have positive impacts and minimal negative consequences that could arise from their implementation. For instance, before giving inspectors administrative citation authority, they should have sufficient training and standards to be sensitive to the plight of low-income residents and ensure that this type of enforcement action does not unjustly burden lower-income residents.

Additionally, each recommendation requires the input and collaboration of multiple stakeholders to design properly. The creation of a prioritization system that puts heavier weight on health-related violations and interior health and safety issues, for instance, should be designed carefully with the input of public health professionals, health care providers, housing experts, and their legal counsels. And, any updates to protocols and standards for bed bugs and mold for city HCE agencies should be compared with those of the public housing agency and harmonized with those standards.

More research connecting housing conditions, code enforcement, and health and safety outcomes would also be useful, so that the connections can be better understood. An analysis of the relationship between housing code enforcement request closings and crime would be a logical extension to this current HIA, which the team has already begun. Other work connecting substandard housing conditions to specific health outcomes would help code inspectors better prioritize requests.

Finally, each of the changes made based on these recommendations should be informed by and be in concert with affected community members. This will ensure that the changes are not only what residents desire, but that they are implemented fairly and equitably. More broadly, many of these recommendations are needed because of the systematic, institutional barriers that have led to the inequities that we see in Memphis today. Therefore, a larger conversation must take place that situates this work within this larger framework and addresses the barriers that still exist today.

We have found that code enforcement is a promising and understudied method of improving population health. Implementing more strategic code enforcement could better address upstream social determinants of health, preventing people from getting sick in the first place. Together, strategic

code enforcement, active cross-sector collaborations, coordinated data systems, and political will can be the prescription that Memphis and other cities need to more actively address housing as a social determinant of health.

Notes

- ¹ Throughout, we use code enforcement (CE) agencies to encompass all local government departments and offices that have compliance and enforcement functions or responsibilities for a defined set of state and local property, building, health, and environmental codes and regulations; this is not restricted to those with “code enforcement” in their name. The enforcement function can be housed in different departments within a city or county government, such as housing, zoning, or building CE.
- ² As one example of a state housing code, these and other similar conditions can be found in California Health and Safety Code Section 17920; see also 24 C.F.R. § 5.425, <https://www.gpo.gov/fdsys/pkg/CFR-2000-title24-vol1/xml/CFR-2000-title24-vol1-sec5-425.xml>.
- ³ “Lead: Prevention Tips,” US Centers for Disease Control and Prevention, last updated June 19, 2014, <https://www.cdc.gov/nceh/lead/tips.htm>.
- ⁴ For the history and evolution of our thinking and teaching on strategic code enforcement, see Lind and Schilling 2016.
- ⁵ “Profile of General Population and Housing Characteristics: 2010,” US Census Bureau, 2010, <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk>.
- ⁶ Joseph Schilling, “Lessons from Memphis’s collaborative campaign against blight,” *Urban Wire* (blog), Urban Institute, April 29, 2016, <https://www.urban.org/urban-wire/lessons-memphiss-collaborative-campaign-against-blight>.
- ⁷ “Food Deserts: Policy Development 2014,” Tennessee Farm Bureau Federation, 2014, <https://www.tnfarmbureau.org/wp-content/uploads/2010/10/Food-Deserts.pdf>.
- ⁸ American Community Survey, 2012–16.
- ⁹ “Asthma program improves health, lowers healthcare costs,” Le Bonheur Children’s Hospital, accessed October 13, 2018, <http://www.LeBonheur.org/for-providers/physician-publications/delivering-on-a-promise/winter-2014/breathe-easy.dot>.
- ¹⁰ “Reports on Memphis Demographics,” Memphis Property Hub, accessed October 13, 2018, <https://memphisfightsblight.policymap.com/maps>.
- ¹¹ Steve Barlow, “Memphis Fights Blight: Collaborating to Win the Battle Against Vacant and Abandoned Property,” Federal Reserve Bank of St. Louis, 2016, <https://www.stlouisfed.org/publications/bridges/fall-2016/memphis-fights-blight>.
- ¹² “History of Environmental Court,” Shelby County Tennessee, accessed October 13, 2018, <https://www.shelbycountyttn.gov/2125/History-of-Environmental-Court>.
- ¹³ Bill Dries, “Potter Reflects on 30 Year Tenure as Environmental Court Judge,” *The Daily News*, January 27, 2012, <https://www.memphisdailynews.com/news/2012/jan/27/potter-reflects-on-30-year-tenure-as-environmental-court-judge/>.
- ¹⁴ “Judge Larry E. Potter,” Shelby County Tennessee, accessed October 13, 2018, <http://www.shelbycountyttn.gov/DocumentCenter/View/580/About-Judge-Potter?bidId=>. Judge Potter has become known as the “Father of Environmental Courts” in the United States as other counties have followed the example and established similar courts.
- ¹⁵ “2017 Memphis Housing Authority/HOPE VI Development Property Portfolio,” Memphis Housing Authority, 2017, <https://memphisha.org/images/2017-MHA-Property-Portfolio.pdf>.

- ¹⁶ See, “Housing Choice Voucher Program (HCVP): Types of Inspections,” Memphis Housing Authority, accessed October 13, 2018, https://memphisha.org/pdf_forms/Types%20of%20Inspections.pdf.
- ¹⁷ “HCD Departments,” City of Memphis, accessed October 13, 2018, https://memphistn.gov/government/housing_and_community_development/hcd_departments.
- ¹⁸ “About Us,” Memphis Division of Housing and Community Development Lead Paint Department, accessed October 13, 2018, <http://leadsafememphis.org/about.html>.
- ¹⁹ “About Us,” Shelby County Health Department, accessed October 13, 2018, <http://www.shelbytnhealth.com/27/About-Us>.
- ²⁰ Andy Meek, “Memphis Health Care Thrives with Investments, Growth,” *Daily News*, December 28, 2016, <https://www.memphisdailynews.com/news/2016/dec/28/memphis-health-care-thrives-with-investments-growth/>.
- ²¹ Jason Bolton, “Largest Memphis Area Hospitals,” *Memphis Business Journal*, November 10, 2017, <https://www.bizjournals.com/memphis/subscriber-only/2017/11/10/largest-memphis-area-hospitals.html>.
- ²² See Green and Healthy Homes Initiative, website, <https://www.greenandhealthyhomes.org/>.
- ²³ Organizing the insights and results from our interviews and focus groups into the six clusters also helped us maintain individual anonymity, mitigate disclosure risks, and create a climate for open and honest conversations.
- ²⁴ We rely on the classics within the field. See, Susskind et al. 1999; Innes and Booher 1999; Booher and Innes 2002.
- ²⁵ HCD also runs the city’s mold and lead abatement programs, where this role could more closely align with HCE agencies and the environmental health department as they inspect and investigate individual, property-specific cases.
- ²⁶ Shelby County Building Inspection would play a role in reviewing the rehabilitation plans and permits for an owner or landlord to rehabilitate a substandard rental property, but we did not have the opportunity to interview them
- ²⁷ We acknowledge that though NPI is our research partner in this project and the Property Hub assisted us in curating different data points for our analysis, they play such vital roles in this ecosystem that our stakeholder analysis would seem to be incomplete without examining their roles.
- ²⁸ “Mold,” Shelby County Health Department, 2018, <http://tn-shelbycountyhealth.civicplus.com/177/Mold>.
- ²⁹ According to the 2012–16 American Community Survey, African-Americans make up 63 percent of the City of Memphis’ population and consist of 95.5 percent of the city’s residents of color.
- ³⁰ Multifamily units are defined as any structure with more than one unit.
- ³¹ The fourth amendment of the US and Tennessee constitutions protects individuals and property owners from unreasonable searches and seizures by government officials (e.g., police inspectors and code enforcement inspectors). When it comes to inspecting the outside yards and especially the interior of homes or private residence, the courts, including the US Supreme Court, impose much stricter legal rules unless the government (1) gets the permission of the owner or tenant to come onto or inside the premises; or (2) obtains a special court order, in our case an administrative inspection warrant that justifies (e.g., shows reasonable cause) that violations could be or are present on the property. Although the Shelby County Environmental Court has capacity to review and issue such administrative inspection warrant, our interviews revealed that HCE has rarely made such warrant requests of the court.
- ³² We recognize that most residents, as well as their relatives, friends, and neighbors are unlikely to file service requests or complaints for interior inspections of their own homes or apartments. Such services request may come, however, from nonprofit, health care, or social service providers who work in the homes or apartments.

Thus, the complexities of these pathways to interior inspections should be thoroughly examined and discussed as they balance the health of occupants with the city's legal and policy obligations.

- ³³ An HCE inspector could contact a police inspector who could issue a citation for a code violation, but this process might trigger a criminal case as opposed to a civil case under the Neighborhood Preservation Act.
- ³⁴ Farida Jhabvala Romero, "Oakland Wants to Tax Vacant Properties to Help Ease Homelessness," *KQED News*, September 1, 2018, <https://www.kqed.org/news/11689739/oakland-wants-to-tax-vacant-properties-to-help-ease-homelessness>.
- ³⁵ For example, in Washington, DC, ordinary buildings are taxed at 85 cents per \$100 in assessed value. For a vacant property, that rate increases to \$5 per \$100 and if a property is judged by the city to be neglected or "blighted" the tax rate jumps to \$10 per \$100 in assessed value. Martin Auster Muhle, "D.C. Failed to Enforce Law On Vacant and Blighted Homes, Audit Says," *WAMU 88.5*, September 21, 2017, <https://wamu.org/story/17/09/21/d-c-failed-enforce-law-vacant-blighted-homes-says-audit/>.
- ³⁶ "Every Memphian Deserves Great Health Care," *Regional One Health*, accessed October 13, 2018, <https://www.regionalonehealth.org/one-health/>.
- ³⁷ Zaneta Lowe, "Problems continue at apartments formerly run by Global Ministries Foundation," *Channel 3 News*, August 17, 2018, <https://wreg.com/2018/08/17/problems-continue-at-apartments-formerly-run-by-global-ministries-foundation/>.
- ³⁸ With the guidance of NPI and data from the Property Hub, the Blight Elimination Steering Committee developed a preliminary list of property owners and landlords with the most code enforcement cases. A good first step. However, it's unclear what concerted action HCE is taking or will take against those owners and properties.
- ³⁹ See, for example, Doug Donovan, "Strict landlord oversight in Minnesota offers Baltimore a model," *Baltimore Sun*, October 13, 2018, <http://www.baltimoresun.com/news/maryland/investigations/bs-md-solutions-minneapolis-20171213-story.html>.
- ⁴⁰ Bonhia Lee, "When will Fresno's promised rental inspection program begin?" *Fresno Bee*, October 5, 2017, <https://www.fresnobee.com/news/special-reports/housing-blight/article177225101.html>.
- ⁴¹ "Children's Mercy Kansas City Hospital Is Improving Health by Improving Housing," *US Department of Housing and Urban Development*, accessed October 18, 2018, <https://www.huduser.gov/portal/casestudies/study-100118.html>.

References

- Aurand, Andrew, Dan Emmanuel, Diane Yentel, Ellen Errico. 2017. "The Gap: A Shortage of Affordable Homes." Washington, DC: National Low Income Housing Coalition.
- Badland, Hannah, Sarah Foster, Rebecca Bentley, Carl Higgs, Rebecca Roberts, Christopher Petit, and Billie Giles-Corti. 2017. "Examining Associations between Area-Level Spatial Measures of Housing with Selected Health and Wellbeing Behaviours and Outcomes in an Urban Context." *Health and Place* 43:17–24.
- Baldo, Juliana V., Laeeq Ahmad, and Ronald Ruff. 2002. "Neuropsychological Performance of Patients Following Mold Exposure." *Applied Neuropsychology* 9 (4): 193–202.
- Barlow, Steven E., Daniel M. Schaffzin, and Brittany J. Williams. 2017. "Ten Years of Fighting Blighted Property in Memphis: How Innovative Litigation Inspired Systems Change and a Local Culture of Collaboration to Resolve Vacant and Abandoned Properties." *Journal of Affordable Housing* 25 (3): 347–89.
- Bashir, Samiya A. 2002. "Home Is Where the Harm Is: Inadequate Housing as a Public Health Crisis." *American Journal of Public Health* 92 (5): 733–8.
- Beck, Andrew F., Bin Huang, Raj Chundur, and Robert Kahn. 2014. "Housing Code Violation Density Associated with Emergency Department and Hospital Use by Children with Asthma." *Health Affairs* 33 (11): 1,993–2,002.
- Becker, Jonathan A. and Lynsey K. Stewart. 2011. "Heat-Related Illness." *American Family Physician* 83 (11): 1,325–30.
- Bell, Judith, Gabriella Mora, Erin Hagan, Victor Rubin, Allison Karpyn. 2013. "Access to Healthy Food and Why It Matters: A Review of the Research." Oakland, CA: PolicyLink.
- Bell, Michelle L., Keita Ebisu, Roger D. Peng, and Francesca Dominici. 2009. "Adverse Health Effects of Particulate Air Pollution: Modification by Air Conditioning." *Epidemiology* 20 (5): 682–86.
- Booher, David E., and Judith Innes. 2002. "Network Power in Collaborative Planning." *Journal of Planning Education and Research* 21 (3): 221–36.
- Bourcier, Emily, Diana Charbonneau, Carol Cahill, and Andrew L. Dannenberg. "An Evaluation of Health Impact Assessments in the United States, 2011–2014." *Preventing Chronic Diseases* 12:140476.
- Branas, Charles, Michelle Kondo, Sean M. Murphy, Eugenia C. South, Daniel Polsky, and John M. MacDonald. 2016. "Urban Blight Remediation as a Cost Beneficial Solution to Firearm Violence." *American Journal of Public Health* 106 (12): 2,158–64.
- Branas, Charles C., Eugenia South, Michelle C. Kondo, Bernadette C. Hohl, Philippe Bourgois, Douglas J. Wiebe, and John M. MacDonald. 2018. "Citywide Cluster Randomized Trial to Restore Blighted Vacant Land and Its Effects on Violence, Crime, and Fear." Washington, DC: Proceedings of the National Academy of Sciences.
- Chambers, Earle C., and Emily Rosenbaum. 2013. "Cardiovascular Health Outcomes of Latinos in the Affordable Housing as an Obesity Mediating Environment (AHOME) Study: A Study of Rental Assistance Use." *Journal of Urban Health: Bulletin of the New York Academy of Medicine* 91 (3): 489–98.
- Coley, Rebekah Levine, Tama Leventhal, Alicia Doyle Lynch, and Melissa Kull. 2013. "Relations between Housing Characteristics and the Well-Being of Low-Income Children and Adolescents." *Developmental Psychology* 49 (9): 1,775–89.
- Collins, K. J. 1986. "Low Indoor Temperatures and Morbidity in the Elderly." *Age and Ageing* 15 (4): 212–20.
- Community Lift. 2015. "Community Development in Memphis: A Review of CDC Capacity and Performance and the State of the Industry." Memphis, TN.

- Corburn, Jason. 2009. *Toward the Healthy City: People, Places, and the Politics of Urban Planning*. Cambridge, MA: MIT Press.
- Coulton, Claudia, Robert L. Fischer, Francisca Garcia-Cobian Richter, Seok-Joo Kim, and Youngmin Cho. 2016. "Housing Crisis Leaves Lasting Imprint on Children in Cleveland." Chicago, IL: MacArthur Foundation.
- Crocker, Deidre D., Stella Kinyota, Gema Dumitru, Colin Ligon, Elizabeth Herman, Jill Ferdinand, David Hopkins, Briana Lawrence, and Teresa Sipe. 2011. "Effectiveness of Home-Based, Multi-Trigger, Multicomponent Interventions with an Environmental Focus for Reducing Asthma Morbidity." *American Journal of Preventive Medicine* 41 (2S1): S5–S32.
- Cui, Lin, and Walsh, Randall, 2015. "Foreclosure, Vacancy and Crime." *Journal of Urban Economics* 87 (C): 72–84.
- Cui, Lin. 2010. "Foreclosure, Vacancy and Crime." PhD dissertation, Department of Economics, University of Pittsburgh.
- Dannenberg, Andrew L., Rajiv Bhatia, Brian L. Cole, Sarah K. Heaton, Jason D. Feldman, and Candace D. Rutt. 2008. "Use of Health Impact Assessment in the U.S.: 27 Case Studies 1999-2007." *American Journal of Preventative Medicine* 34 (3): 241–56.
- de Leon, Erwin, and Joseph Schilling. 2017. *Urban Blight and Public Health: Addressing the Impact of Substandard Housing, Abandoned Buildings, and Vacant Lots*. Washington, DC: Urban Institute.
- Dillahunt, Tawanna, Jennifer Mankoff, and Eric Paulos. 2010. "Understanding Conflict Between Landlords and Tenants: Implications for Energy Sensing and Feedback." *Proc Ubicomp '10*, ACM 2010: 149–58.
- Eriksen, Michael D., Nadia Greenhalgh-Stanley, and Gary V. Englehardt. 2015. "Home Safety, Accessibility, and Elderly Health: Evidence from Falls." *Journal of Urban Economics* 87:14–24.
- Evans, Gary W. 2004. "The Environment of Childhood Poverty." *American Psychologist* 59 (2): 77–92.
- Evans, Gary W. 2006. "Child Development and the Physical Environment." *Annual Review of Psychology* 57:423–51.
- Evans, Gary W., Nancy M. Wells, and Annie Moch. 2003. "Housing and Mental Health: A Review of the Evidence and a Methodological and Conceptual Critique." *Journal of Social Issues* 59 (3): 475–500.
- Fazili, Sameera. 2017. "Can Community Development Improve Health? Emerging Opportunities for Collaboration between the Health and Community Development Sectors." Atlanta, GA: Federal Reserve Bank of Atlanta.
- Fuller, Joseph, James O'Connor, Richard Rawlinson. 1993. "Tailored Logistics: The Next Advantage." *Harvard Business Review* May/June: 87–98.
- Ganesh, Bhargavi, Corianne Scally, Laura Skopec, and Jun Zhu. 2017. "The Relationship between Housing and Asthma among School-Age Children: Analysis of the 2015 American Housing Survey." Washington, DC: Urban Institute.
- Gifford, Robert, and Cécile Lacombe. 2006. "Housing Quality and Children's Socioemotional Health." *Journal of Housing and the Built Environment* 21 (2): 177–89.
- Heller, Jonathan, Shireen Malekafzali, Lynn C. Todman, and Megan Wier. 2013. "Promoting Equity through the Practice of Health Impact Assessment." Oakland, CA: PolicyLink.
- Hernández, Diana. 2016. "Understanding 'Energy Insecurity' and Why It Matters to Health." *Social Science and Medicine* 167:1–10.
- Hopton, Jane L., and Sonja M. Hunt. 1996. "Housing Conditions and Mental Health in a Disadvantaged Area in Scotland." *Journal of Epidemiology and Community Health* 50 (1): 56–61.
- Innes, Judith, and David E. Booher. 1999. "Consensus Building and Complex Adaptive Systems." *Journal of the American Planning Association* 64 (4): 412–23.

- Jones, Robert L., David M. Homa, Pamela A. Meyer, Debra J. Brody, Kathleen L. Caldwell, James L. Pirkle, and Mary Jean Brown. 2009. "Trends in Blood Lead Levels and Blood Lead Testing Among US Children Aged 1 to 5 Years, 1988–2004." *Pediatrics* 123 (3): e367–e385.
- Keller, Susan Etta. 1988. "Does the Roof Have to Cave in? The Landlord/Tenant Power Relationship and the Intentional Infliction of Emotional Distress." *Cardozo Law Review* 9:1,663–98.
- Kersten, Ellen J., Kaja LeWinn, Laura Gottlieb, Douglas Jutte, and Nancy Adler. 2014. "San Francisco Children Living in Redeveloped Public Housing Used Acute Services Less Than Children in Older Public Housing." *Health Affairs* 33 (12): 2,230–7.
- Kling, Jeffrey R., Liebman, Jeffrey B., Katz, Lawrence F. and Sanbonmatsu, Lisa. 2004. "Moving to opportunity and tranquility: Neighborhood effects on adult economic self-sufficiency and health from a randomized housing voucher experiment" Princeton IRS Working Paper No. 481.
- Kondo, Michelle, Danya Keene, Bernadette C. Hohl, John M. MacDonoald, and Charles C. Branas. 2015. "A Difference-in-Differences Study of the Effects of a New Abandoned Building Remediation Strategy on Safety." *PLOS ONE* 10 (8).
- Krieger, James, and Donna L. Higgins. 2002. "Housing and Health: Time Again for Public Health Action." *American Journal of Public Health* 92 (5): 758–68.
- Leventhal, Tama, and Sandra Newman. 2010. "Housing and Child Development." *Children and Youth Services Review* 32 (9): 1,165–74.
- Li, Y., G. M. Yeung, J. W. Tang, X. Yang, C. Y. Chao, J. Z. Lu, P. V. Neilsen, J. Niu, H. Qian, A. C. Sleight, H. J. Su, J. Sundell, T. W. Wong, and P. L. Yuen. 2007. "Role of Ventilation in Airborne Transmission of Infectious Agents in the Built Environment: A Multidisciplinary Systematic Review." *Indoor Air* 17 (1): 2–18.
- Lind, Kermit J. 2012. "Collateral Matters: Housing Code Compliance in the Mortgage Crisis." *Northern Illinois University Law Review* 23 (3): 446–71.
- Lind, Kermit, and Joe Schilling. 2016. "Abating Neighborhood Blight with Collaborative Policy Networks – Where Have We Been and Where are we Going?" *University of Memphis Law Review* 46 (4): 803–55.
- Lowry, Stella. 1989. "Health and Housing: Noise, Space, and Light." *BMJ* 299 (6713): 1,439–42.
- Mallach, Alan. 2010. "Raising the Bar: A Short Guide to Landlord Incentives and Rental Property Regulation." Washington, DC: Center for Community Progress.
- Mallach, Alan. 2015. "Raising the Bar: Linking Landlord Incentives and Regulation through Rental Licensing." Washington, DC: Center for Community Progress.
- Mendall, Mark J., Anna G. Mirer, Kerry Cheung, My Tong, and Jeroen Douwes. 2011. "Respiratory and Allergic Health Effects of Dampness, Mold, and Dampness-Related Agents: A Review of the Epidemiologic Evidence." *Environmental Health Perspectives* 119 (6): 748–56.
- Mudarri, David, and William J. Fisk. 2007. "Public Health and Economic Impact of Dampness and Mold." *Indoor Air* 17 (3): 226–35.
- Needleman, Herbert L., Alan Schell, David Bellinger, Alan Leviton, and Elizabeth N. Allred. 1990. "The Long-Term Effects of Exposure to Low Doses of Lead in Childhood: An 11-Year Follow-up Report." *New England Journal of Medicine* 322:83–88.
- Papas, Mia A., Anthony J. Alberg, Reid Ewing, Kathy J. Helzlsouer, Tiffany L. Gary, and Ann C. Klassen. 2007. "The Built Environment and Obesity." *Epidemiologic Reviews* 29(1): 29–43.
- Popplestone, Gerald. 1972. "Collective Action among Private Tenants." *British Journal of Social Work* 2 (3): 369–86.
- O'Campo, P., X. Xue, M. C. Wang, and M. Caughy. 1997. "Neighborhood Risk Factors for Low Birthweight in Baltimore: A Multilevel Analysis." *American Journal of Public Health* 87 (7): 1,113–18.

- Ogari, Lillian, and David Sweat. 2016. "Seeing Is Believing: Patterns of Life Expectancy, Poverty, Equity and Health in Shelby County TN." TN: Shelby County Health Department, Office of Epidemiology.
- Olsen, Noel D. 2001. "Prescribing Warmer, Healthier Homes: British Policy to Improve Homes Should Help Both Health and the Environment." *BMJ* 322 (7,289): 748–49.
- Orellano, Pablo, Nancy Quaranta, Julieta Reynoso, Brenda Balbi, and Julia Vasquez. 2017. "Effect of Outdoor Air Pollution on Asthma Exacerbations in Children and Adults: Systematic Review and Multilevel Meta-Analysis." *PLoS One* 12 (3): 1–15.
- Rauh, Virginia A., Ginger R. Chew, and Robin S. Garfinkel. 2002. "Deteriorated Housing Contributes to High Cockroach Allergen Levels in Inner-City Households." *Environmental Health Perspectives* 110 (Supl 2): 323–7.
- Rauh, Virginia A., Phillip J. Landrigan, and Luz Claudio. 2008. "Housing and Health: Intersection of Poverty and Environmental Exposures." *Annals of the New York Academy of Science* 1,136 (1): 276–88.
- Reid, Margaret, Melissa Fiffer, Nivedita Gunturi, Amanda Ali, Dion Irish, and Megan Sandel. 2014. "Breathe Easy at Home; A Web-Based Referral System Linking Clinical Sites with Housing Code Enforcement for Patients with Asthma." *Journal of Environmental Health* 76 (6).
- Roper, William L., Vernon Houk, Henry Falk, and Sue Binder. 1991. "Preventing Lead Poisoning in Young Children." Atlanta, GA: Centers for Disease Control and Prevention.
- Rose, Kalima, and Teddy Ky-Nam Miller 2016a. "Communities of Opportunity: Pursuing a Housing Policy Agenda to Achieve Equity and Opportunity in the Face of Post-Recession Challenges." *Trotter Review* 23 (1): Article 3.
- Rose, Kalima, and Teddy Ky-Nam Miller. 2016b. "Healthy Communities of Opportunity: An Equity Blueprint to Address America's Housing Challenges." Oakland, CA: PolicyLink.
- Roux, Ana V. Díez, Sharon Stein Merkin, Donna Arnett, Lloyd Chambless, Mark Massing, F. Javier Nieto, Paul Sorlie, Moyses Szklo, Herman A. Tyroler, and Robert L. Watson. 2001. "Neighborhood of Residence and Incidence of Coronary Heart Disease." *New England Journal of Medicine* 345 (2): 99–106.
- Sadler, Richard Casey, Jesenia Pizarro, Brandon Turchan, Stephen P. Gasteyer, and Edmund F. McGarrell. 2017. "Exploring the Spatial-Temporal Relationships between a Community Greening Program and Neighborhood Rates of Crime." *Applied Geography* 83:13–26.
- Sandberg, Joanne C., Jennifer W. Talton, Sara A. Quandt, Haiying Chen, Maria Weir, Walkiria R. Doumani, Arjun B. Chatterjee, and Thomas A. Arcury. 2014. "Association Between Housing Quality and Individual Health Characteristics on Sleep Quality among Latino Farmworkers." *Journal of Immigrant Minor Health* 16 (2): 265–72.
- Sally, Corianne, Elaine Waxman, Ruth Gourevitch, and Sade Adeeyo. 2017. *Emerging Strategies in Integrating Health and Housing*. Washington, DC: Urban Institute.
- Schilling, Joseph. 2009. "Code Enforcement and Community Stabilization: The Forgotten First Responders to Vacant and Foreclosed Homes." *Albany Law Review* 2:101–62.
- Schnake-Mahl, Alina, and Sarah Norman. 2017. "Building Healthy Places: How Are Community Development Organizations Contributing?" Cambridge, MA: Joint Center for Housing Studies of Harvard University.
- Shaw, Mary. 2004. "Housing and Public Health." *Annual Review of Public Health* 25:397–418.
- Shenassa, Edmond D., Constantine Daskalakis, Allison Liebhaber, Matthias Braubach, and Mary Jean Brown. 2007. "Dampness and Mold in the Home and Depression: An Examination of Mold-Related Illness and Perceived Control of One's Home as Possible Depression Pathways." *American Journal of Public Health* 97 (10): 1,893–99.
- Sheehan, William J., Pitud A. Rangithienchai, Robert A. Wood, Don Rivard, Sasewan Chinratanapisit, Matthew S. Perzanowski, Ginger L. Chew, James M. Seltzer, Elizabeth C. Matsui, and Wanda Phipatanakul. 2010. "Pest and Allergen Exposure and Abatement in Inner-City Asthma: A Work Group Report of the American Academy of

- Allergy, Asthma and Immunology Indoor Allergy/Air Pollution Committee." *Journal of Allergy and Clinical Immunology* 125 (3): 575–81.
- Somerville, M., I. Mackeznie, P. Owen, and D. Miles. 2000. "Housing and Health: Does Installing Heating in Their Homes Improve the Health of Children with Asthma?" *Public Health* 114 (6): 434–39.
- South, Eugenia, Bernadette C. Hohl, Michelle C. Kondo, John M. McDonald, and Charles C. Branas. 2018. "Effect of Greening Vacant Land on Mental Health of Community-Dwelling Adults: A Randomized Trial." *JAMA Network Open* 1 (3): e180298.
- Spader, Jonathan, Jenny Schuetz, and Alvaro Cortes. 2016. "Fewer Vacants, Fewer Crimes? Impacts of Neighborhood Revitalization Policies on Crime." *Regional Science and Urban Economics* 60:73–84.
- Stacy, Christina Plerhoples. 2017. "The Effect of Vacant Building Demolitions in Crime Under Depopulation." *Journal of Regional Science*, 58 (1): 100–15.
- Susskind, Lawrence, Sarah McKernan, and Jennifer Thomas-Lamar, eds. 1999. *The Consensus Building Handbook: A Comprehensive Guide to Reaching Agreement*. Cambridge, MA: SAGE Publications.
- Suther, Emily, and Megan Sandel. 2013. "Health Impact Assessments." *Rhode Island Medical Journal* 96 (13): 27–30.
- Thornton, Rachel L. Johnson, Amelia Greiner Safi, Caroline M. Fichtenberg, Beth J. Feingold, Jonathan M. Ellen, and Jacky Jennings. 2013. "Achieving a Healthy Zoning Policy in Baltimore: Results of a Health Impact Assessment of the TransForm Baltimore Zoning Code Rewrite." *Public Health Reports* 128 (Suppl 3): 87–103.
- Urban Child Institute. 2013. "Data Book 2013: The State of Children in Memphis & Shelby County." Memphis, TN: Urban Child Institute.
- US Office of the Surgeon General. 2009. *The Surgeon General's Call to Action to Promote Healthy Homes*. Rockville, MD: US Office of the Surgeon General.
- Vaughan, Ted R. 1968. "The Landlord-Tenant Relation in a Low-Income Area." *Social Problems* 16 (2): 208–18.
- Wang, Hong-Yu, Gary W.K. Wong, Yu-Zhi Chen, Alexander C. Ferguson, Justina M. Greene, Yu Ma, Nan-Shan Zhong, Christopher K.W. Lai, and Malcolm R. Sears. 2008 "Prevalence of Asthma among Chinese Adolescents Living in Canada and in China." *Canadian Medical Association Journal* 179 (11): 1,133–42.
- Wernham, Aaron. 2011. "Health Impact Assessments Are Needed in Decision Making About Environmental and Land-Use Policy." *Health Affairs* 30 (5): 947–56.
- Wilson, Ronald E., Timothy H. Brown, and Beth Schuster. 2009. "Preventing Neighborhood Crime: Geography Matters." *NIJ Journal* 263:30–5.

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